THE

AMERICAN YEAR-BOOK

OF

MEDICINE AND SURGERY

BEING

A Yearly Digest of Scientific Progress and Authoritative Opinion in all Branches of Medicine and Surgery, drawn from Journals, Monographs, and Text-Books of the Leading American and Foreign Authors and Investigators

COLLECTED AND ARRANGED

WITH CRITICAL EDITORIAL COMMENTS

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PREFACE.

THE single change in the editorial department is occasioned by the absence of Dr. W. W. Keen from the United States. Subscribers will be glad that Dr. J. Chalmers DaCosta has consented to take charge of the department of Surgery, with the assistance of Dr. J. H. Gibbon.

GEO. M. GOULD.

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GENERAL SURGERY.

By J. CHALMERS DaCOSTA, M.D., and JOHN H. GIBBON, M.D.,
of Philadelphia.

ASEPSIS AND ANTISEPSIS.

Binnie,[1] in discussing the **cleansing of the surgeon's hands,** shows that absolute scientific sterilization is an impossibility with the means at our disposal. Since rubber gloves produce sweating of the hands they are no longer safe, but may become the source of great danger if they are punctured. Reference is made to the recent recommendations of elastic varnishes, the receipts for which have of late appeared in the "Centralblatt für Chirurgie." Binnie thinks the same objection holds here as in the case of rubber gloves and that the value of the method is doubtful. The author maintains that scientifically clean hands cannot be obtained, but every effort should be made to be as clean as possible. Binnie advocates the method employed by König, of avoiding unnecessary touching and handling of the wound, by the careful use of instruments.

König[2] urges upon operators the **avoidance of unnecessary direct manual contact with wounds.** No method at present is known of absolutely sterilizing the hands, and therefore the less handling of the wound, the less likelihood will there be of infection. The author shows that in many operations, with a little care and practice, we need scarcely touch the wound. The use of long instruments is recommended to aid in the avoidance of manual contact. The edges of the wound can be held apart with broad retractors, thus rendering access to parts below easy and obviating the danger of manual contact. König attributes his own aseptic results largely to a close adherence to this practice.

R. Kossman[3] proposes as a **substitute for rubber gloves** a varnish for the hands. It consists of a solution of certain hard resins and fatty oils in a mixture of ether with a low boiling-point and alcohol; it is called **chirol** and is patented. After disinfection the hands are submerged in this fluid and then allowed to dry, the drying occupying 2 or 3 minutes. The coating is removed by washing the hands in alcohol. It is thin, soft, pliable, does not interfere with sensation or limit the movements of the hand, and is stable enough to withstand the longest operations without becoming loose. Further, it may be applied to the operative field as a protective coating.

[1] Editorial, Ann. of Surg., Mar., 1901. [2] Centralbl. f. Chir., No. 36, 1900.
[3] Centralbl. f. Chir., Nov. 21, 1900.

Carstens[1] discusses the qualifications which **suture material** must possess, and recommends **dry sterilized catgut** as the best we now have. His objection to most of the suture materials is that they "last too long." He says that a suture in most instances has done all it can do within a few days or a week and that after that it is useless. Reverdin, Döderlein, and others have recommended the use of dry sterilized catgut, but difficulty lies in obtaining thorough sterilization. Boerckmann's method has, however, done away with this objection. The author prepares his own catgut in the following manner: "The catgut is put into ether for a few days or a week, till the fat is all removed, and then cut into strips 18 or 20 inches long. Three of these are wrapped in fine tissue paper. The tissue paper bundle is placed in a small envelop, the latter closed, and then placed in the Boerckmann sterilizer and subjected to dry heat for 3 hours. The thermometer is kept in the apparatus, so that one can see that the heat is at least 300° F. At the expiration of that time the heat is shut off and the ligatures remain in the apparatus without disturbance for from 12 to 18 hours, which allows spores present an opportunity to develop. Then the sutures are again subjected to a heat of 300° F." The author has carried these envelops loose in his bag for months and had cultures made from the gut with invariably a negative result. The precaution, however, was always observed of keeping the envelops perfectly dry. When it is desirable to have a suture remain in the tissues longer than plain catgut will last, kangaroo-tendon is to be used.

Elsberg[2] describes a **new and simple method of sterilizing catgut.** Raw catgut is immersed for 48 hours in a mixture consisting of 1 part of chloroform and 2 parts of ether. It is then rolled on glass spools and boiled for from 20 to 30 minutes in a saturated solution of ammonium sulphate made by adding the salt to boiling water. It is then taken out and shaken up for ½ to 1 minute in warm sterile water, carbolic, or sublimate solution to remove the salt. It may be preserved in undiluted alcohol. After this procedure the gut is strong, pliable, and does not swell. It is absorbed in from 4 to 8 days. It has been proved by bacteriologic investigations to be sterile. The gut may be repeatedly boiled in this solution. The method is cheap (ammonium sulphate can be bought for from 15 to 25 cents a pound) and no special apparatus is required. The high boiling-point of the solution makes the destruction of organisms absolutely assured.

Lilienthal[3] first calls attention to the frequent infection of operation wounds by the skin staphylococcus which comes in contact with the sutures closing the wound. He recommends as a substitute for sutures **sterilized zinc oxid adhesive plaster.** The deeper structures are closed by subcutaneous sutures and the skin brought in perfect apposition by means of strips of the plaster. He has employed this method of wound closure for 3 years with most satisfactory results regarding aseptic healing and cosmetic appearance. The plaster is made by a re-

[1] N. Y. Med. Jour., Oct. 27, 1900. [2] Centralbl. f. Chir., May 26, 1900.
[3] N. Y. Med. Jour, vol. LXXIII, p. 240.

liable chemist and has proved absolutely sterile. The method commends itself also because it saves time and saves the pain of removing stitches.

Galloway[1] reports an interesting case of **septicemia** in which remarkably good effects were obtained from the use of **antistreptococcic serum.** The patient was a young woman 22 years of age, who, after scarlet fever, developed a large deep-seated abscess of the neck which threatened suffocation, and which was accompanied by symptoms of septicemia. The patient became extremely ill. Six daily doses of 10 cc. of the serum were given, with the result that the swelling in the neck markedly diminished and the temperature and other symptoms subsided. Convalescence was very slow, but complete. As the swelling in the neck gradually disappeared no culture was made, but the author thinks it to have been of streptococcic origin. A culture made from pus which exuded from the gums about the teeth showed only the staphylococcus. [This report is certainly inconclusive, and positive deductions are impossible, as cultures were not made. The fact that pus which exuded from the gums contained staphylococci suggests the possibility that an incision might have liberated pus containing staphylococci.]

Howard A. Kelly[2] carefully reviews the **history of antisepsis,** dividing among a number of men the honor of its introduction. To Jules Lemaire is given much of the credit, for he, in 1863, 4 years before Lord Lister's first article upon the subject, published a very comprehensive work on the action and use of carbolic acid. Coal-tar had been used as a powder or paste for a number of years for hygienic purposes. Le Boeuf in 1850 first prepared an emulsion of this agent, and it was with this that Lemaire experimented. Kelly says of him: "In surgery he established the great principle of a living septic agent in putrefying and suppurating wounds, and he laid the foundation-stone of successful treatment." Kelly says that it is not to one, but many, that antisepsis owes its origin.

Vladimiroff[3] tells of the results in **suppurating wounds** from the use of **compresses of soda bicarbonate.** Gauze saturated with a 2% solution of soda is applied to the wound and changed 3 or 4 times in 24 hours. The author has used this dressing in a number of suppurating processes with great satisfaction.

Murphy[4] recommends the application of **adhesive rubber-dam** over the field of operation to protect the wound from skin infection. The dam adheres so closely to the skin that it is not affected by the blood or the solutions used in operating. The rubber is carefully and closely applied to the field of operation and the incision is made through it just as though it were one of the layers of the skin. If ether is first applied to the skin it will make the dam adhere more closely. The dam remains in place until the sutures are introduced, and is then removed. Murphy seems to have been greatly impressed by the employment of this method

[1] Phila. Med. Jour., Aug. 4, 1900. [2] Jour. Am. Med. Assoc., Apr. 20, 1901.
[3] Medicins Koie Obosrink, Feb., 1901, abstracted in Phila. Med. Jour., May 11, 1901. [4] Jour. Am. Med. Assoc., May 4, 1901.

of preventing infection from the skin. He has also found the dam useful when applied to the skin adjacent to discharging sinuses or wounds, as it here prevents irritation, which is often so troublesome. [In a letter to the "Journal of the American Medical Association," May 11, 1901, Fenton B. Türck, of Chicago, asserts that he is the originator of this method of covering the skin with rubber-dam, and refers to several papers which he has written on the subject.—"Journal of the American Medical Association," June 6, 1900; "New York Medical Record," August 10, 1900, and "Philadelphia Medical Journal," March 30, 1901.]

Fig. 1.—Subdermic suture. Method of passing the thread. The transverse section shows the coaptation of the tissues after the suture is tied (Juvara, in Medicine, Dec., 1900).

Fig. 2.—Method of anchoring the thread in intradermic suture (Juvara, in Medicine, Dec., 1900).

E. Juvara[1] recommends the **closure of wounds by subcutaneous and subcuticular sutures of catgut.** In the use of these sutures care must be observed that the needle is entered at points directly opposite one another and at the same distance from the skin surface. Closing a wound in this manner with 2 or 3 rows of sutures entirely obliterates any dead space, and results in the formation of the slightest possible scar. This method of closure is recommended for all operations about the face. [Since the introduction of the subcuticular stitch at the Johns Hopkins Hospital it has came into very general use. Aside from the cosmetic result, and much more important than this, is the fact that since the suture does not pass through the cuticle, it does not come in contact with the skin staphylococcus, and the danger of wound infection from this source is greatly lessened. Silver wire was first employed, but other materials have since been found perfectly satisfactory. Silkworm-gut has been used very extensively, particularly in hernia operations, with the best results as regards primary healing.]

Seneca D. Powell[2] read before the Southern Surgical and Gynecological Association a paper on **carbolic acid in surgery.** The author

[1] La Presse Med., Oct. 3, 1900; Medicine, Dec., 1900.
[2] Phila. Med. Jour., Nov. 24, 1900.

asserts that he can thoroughly control the action of carbolic acid with alcohol and that he uses it in the strength of 95% in abscess cavities with the most satisfactory results. In case of disease of bone he has found it particularly useful.

Von Bruns [1] describes the **disinfection of wounds with pure carbolic acid.** He remarks that our treatment of operation-wounds is well-nigh perfect, but that the treatment of infected wounds is far from satisfactory. Chemic disinfection by antiseptic solutions has proved unsatisfactory. Recently, the author has conducted a number of experiments with pure carbolic acid. He asserts that cases of eczema, intoxication, and gangrene which have occasionally resulted from the use of carbolic acid are due to the fact that a weak solution of the drug was used. Strange as it may seem, the concentrated acid does not produce these effects; for instance, ill result does not follow when it is introduced into the tunica vaginalis for the cure of hydrocele. Reference is made to the use Phelps has made of pure carbólic acid in tuberculous joints. This operator considers alcohol an absolute antidote against the action of the acid. Von Bruns has employed the application of the pure carbolic acid in 80 infected wounds, after first protecting the surrounding skin by wetting it with alcohol. Much less secretion follows the application of the acid than occurs after the ordinary treatment of these wounds, it being sometimes possible to leave the first dressing in place for 4 days. In no case did the acid do local injury, cause toxic symptoms, or produce carboluria. The germicidal power of the acid is not weakened by the secretions or the tissues, and it destroys not only microorganisms on the surface, but also those in the superficial tissues. It is claimed that the sloughing of the superficial tissues brings about a healthy reaction in the layers below. A warning is given against the use of too much of the acid in the wound or allowing more than a minute to elapse before it is followed by irrigation with absolute alcohol.

Honsall, in a paper before the Thirtieth Congress of the German Surgical Association, entitled the **scientific basis of the carbolic-acid treatment of infected wounds,**[2] stated 6 grains to be the extreme limit of carbolic acid that should be used on a wound surface. The deep tissues are affected only when the acid remains for a long time. His experience corresponds with that of von Bruns, the two, in fact, having carried out their investigations together.

Harrington, in a paper before the Massachusetts Medical Society,[3] discusses **carbolic-acid gangrene.** During 5 years at the Massachusetts General Hospital he has seen 18 cases of carbolic gangrene due to the use of this drug in the hands of people ignorant of its effects, and in many of these cases amputation was necessary. The drug has become one of the household remedies for the treatment of wounds, and these cases of gangrene follow its use in this way by the laity. [Two cases of gangrene of the fingers have come under our notice within the past year. One was due to the application of "phenol sodique," a

[1] Phila. Med. Jour., May 18, 1901. [2] Am. Med., May 4, 1901.
[3] Boston M. and S. Jour., May 2, 1901 (abstract).

popular remedy for cuts and bruises. In both instances amputation was necessary.] Harrington has collected 132 cases of gangrene following the use of the weak solutions of carbolic acid, and unfortunately in a few instances the treatment has been suggested by the physician for the dressing of a wound. An aqueous solution of carbolic acid (1% to 5%), if applied as a dressing to the extremities, particularly the fingers or toes, for a number of hours, may produce total destruction of the part. The results are not so marked on the trunk because the tissues are thicker and because the circulation is not so easily interfered with as in the fingers, where the whole part is surrounded by the solution. The profession should understand the danger which is apt to follow the use of moist carbolic dressings, particularly upon the extremities, and should warn the laity against the use of this drug.

Binaghi,[1] after careful research, asserts that the **staphylococcus is the germ most frequently found in the atmosphere of operating rooms and hospitals,** and the number found is in proportion to the number of persons in the room. In dispensaries and waiting-rooms the germ is always present. When temperature and pressure are low, as in February and March, the germ is not so prevalent. The author agrees with Flugge that, when all the usual methods of rendering the field of operation, the instruments, the surgeon's hands, etc., perfectly aseptic have been carried out, the wound may yet become infected from the atmosphere. It is recommended that as few persons as possible should be allowed in operating rooms. [The danger, of course, is not air, but dusty air. The dust carries the bacteria. A danger in clinic rooms is the entrance of a class a short time before and their exit during operations. These movements may fill the air with dust unless the floor has been properly cared for beforehand.]

Elsberg[2] describes a new **method of sterilizing sea sponges by boiling.** The sponges are allowed to soak for 24 hours in an 8% solution of hydrochloric acid in order to render them free from grit, etc. They are then thoroughly rinsed in water. Next they are boiled for 15 minutes in a solution containing 1 part of potassium hydrate and 2 parts of tannic acid to 100 parts of water. These agents are then removed by washing in sterile water or some antiseptic solution and the sponges are preserved in a 3% to 5% solution of carbolic acid. This method of preparation does not in any way interfere with the natural properties of the sponges, and they can be boiled repeatedly without injury. Bacteriologic examination shows sponges treated in this way to be absolutely sterile.

AMPUTATIONS.

Thomas F. Chavasse,[3] in delivering a clinical lecture on **modern methods of amputation at the hip-joint,** showed a woman, aged 27, upon whom he had performed amputation at both hip-joints for tuberculous disease. Prior to the amputation at the right hip the patient had

[1] La Riforma Med., Sept. 22–24, 1900; Med. Rec., Nov. 3, 1900.
[2] Centralbl. f. Chir., Dec. 22, 1900.
[3] Lancet, July 21, 1900.

had two amputations below, the first a Syme's operation at the ankle, the disease having begun in the tarsus, and the second an amputation at the knee-joint. The disease extended and later the hip amputation became necessary. Two years afterward the patient came into the hospital again, suffering from extensive tuberculous disease of the left knee-joint and thigh. Amputation of this extremity at the hip-joint was then done. Since the operation the patient has greatly improved in general health, and there are no evidences of tuberculous processes in other parts of the body. The author has amputated at the hip-joint 15 times with 4 deaths, a mortality of 26.6 %. Six were done for sarcoma, and of these 1 patient died from shock. Nine were done for disease of bone. Three of the 4 deaths were from shock, but Chavasse says that since he has used the intravenous injection of salt solution he has not had a death from shock. His fourth patient died on the third day from no assignable cause; "apparently she had no rallying power." In 3 of the 4 fatal cases the friends of the patient delayed the operation long after it was advised, and to this delay the author thinks the fatality can be ascribed. Reference is made to the mortality statistics of other surgeons, which show a marked decline in the death-rate during recent years. Sheppard [1] gives a mortality of 41.1 % in 245 cases; Page [2] reports 16 cases with 6 deaths, a mortality of 37.5 %; Estes [3] in his own table has 7 cases with 1 death, 14.2 %. Wyeth's collection of cases, omitting the primary ones, shows 8 deaths in 65 cases, 12.3 %. One of these died of pneumonia on the thirty-second day when going about, and a second died of tuberculous peritonitis on the eleventh day. If these are excluded the mortality-rate falls to 9.5 %. From a review of these figures it is concluded that in cases of disease requiring amputation at the hip the surgeon should not only recommend the operation, but urge it, bearing in mind the dangers of delay. Chavasse has employed but two methods of operating. In 3 cases he used the anterior and posterior skin flaps and divided the vessels and muscles as close to the hip-bone as possible, with entire success. This is the method best suited to malignant cases, but it has the drawbacks of requiring direct compression of the aorta and a great liability of shock. The second method employed by the author is the external racquet operation, known also as Lister's amputation. In this operation a circular incision is made through the skin and subcutaneous tissues about 6 inches from Poupart's ligament, a second straight incision is then made beginning at the tip of the greater trochanter and joining the circular incision. The superficial tissues are dissected back as far as the lesser trochanter, when a circular incision is made through the muscles and the bone disarticulated. This is best accomplished by dividing the capsule posteriorly and dislocating the head of the bone through the divided capsule after cutting or tearing the ligamentum teres. Reference is also made to Estes' method of "gradual dissection," in which the femoral vessels are ligated before the flaps are made. The two great

[1] Internat. Encyclop. of Surg., 1882. [2] Lancet, Mar. 5, 1892.
[3] N. Y. Med. Rec., Nov. 4, 1894.

dangers of the operation—hemorrhage and shock—are carefully discussed. The author unhesitatingly asserts that Wyeth's method of preventing hemorrhage is the most satisfactory which we now possess. When this method cannot be employed he uses a pincushion placed over the abdominal aorta and bound in this position by a circular elastic bandage. In 4 cases this compression of the aorta has proved perfectly satisfactory. It is not so applicable in adults as in children. He has had least success in controlling hemorrhage in those cases in which manual compression of the femoral was depended upon, although it was done by one who was experienced. [No reference is made to McBurney's intraabdominal compression of the common iliac, which we have seen prove perfectly satisfactory. See DaCosta's case, page 17.] To prevent and combat shock, it is recommended that the patient's body and extremities, excepting the one to be removed, should be enveloped in cotton wool. The basilic vein of the opposite side should be dissected out by an assistant before the amputation is actually begun, so that saline injection can be made on short notice. In his last 8 cases the author has used the intravenous injection of salt solution with the best results. He thinks it should form a part of every hip-joint amputation. It is not thought that age is so important a factor in prognosis as formerly. Since the introduction of modern methods adults stand the operation remarkably well. Pregnancy is not considered a bar to amputation at the hip, as a number of cases have been reported in which no disturbance followed the operation, although done when pregnancy was far advanced.

Wyeth[1] read a paper before the Philadelphia Academy of Surgery on **amputation at the hip-joint for sarcoma, and the tendency of the growth to recurrence.** The author submitted for discussion a number of tables bearing on immediate and remote results. His table of amputations for all conditions contains 267 cases. In 181 instances the operation was done for sarcoma, with an immediate death-rate of 6%. Of 83 cases carefully traced 51 patients had recurrence. The prognosis is little influenced by the situation of the tumor, whether it be in the soft parts or in the bones. Two cases of recurrence are reported, one very violent case, in which infection with erysipelas resulted in a cure, the patient now being perfectly healthy after 16 years. Wyeth believes that streptococcic infection has a marked inhibitory action on sarcoma, and suggests that infection of the wound may tend to prevent recurrence. Injection of the toxins of the bacillus of erysipelas and Bacillus prodigiosus should be employed every 6 months for at least 6 years after operation.

Keen, in discussing this paper, said that **amputation at the hip-joint should always be advised in sarcoma of the thigh,** and that no operation should ever be done in continuity. Even if recurrence takes place it is apt to be internal and not nearly so painful or troublesome as the original growth. The operation is contraindicated when the hemoglobin is below 50%.

[1] Abstr. in Am. Med., Apr. 6, 1901.

W. B. Coley, of New York, reported **6 amputations at the hip for sarcoma** with recurrence in 4 of the 5 cases traced. The fifth has gone 9 months with no recurrence. All patients should be operated on and the operation followed by the systematic use of the toxin treatment. This treatment should be employed every month or two for a year or two. At least 4 patients have been cured by the toxin treatment.

Deaver favored the **open treatment of the wound,** permitting infection to take place at once.

Porter,[1] of the British Army, reports **2 cases of amputation at the hip-joint for gunshot fracture,** 1 of which resulted in recovery. Case 1 was a cavalryman who was shot through the thigh with presumably a Mauser bullet. The patient bled profusely from the wound of exit near the great trochanter, and packing did not altogether control it. The wound was thoroughly examined under an anesthetic and the bone was found to be extensively shattered just below the neck. Amputation was done 57 hours after the injury. Some difficulty was experienced in disarticulating the bone because of the fracture. The flaps were quickly made by transfixation. Marked shock accompanied and followed the operation. About a week after the operation the patient had two severe secondary hemorrhages, and considerable suppuration occurred, but ultimately he made a good recovery. The patient was kept in a tent containing only a narrow cot and blankets, and dust storms were prevalent; hence it is obvious that his environment was not very conducive to cure. Case 2 was a cavalryman shot through the thigh by an express bullet. Owing to the exigencies of the march immediate amputation could not be done, and 2 days later, when operation was possible, gangrene had set in at the site of the wound. Amputation was performed at the hip-joint. The patient rallied after the operation and the next day was borne on the march by 12 guardsmen. The stump was dressed at midday and looked well. At evening he became delirious and died of what Captain Porter thinks was acute septic absorption.

J. Chalmers DaCosta[2] reports a case of **amputation at the hip-joint for an extensive sarcoma.** The patient was a young girl, and the growth occupied the anterior aspect of the thigh as high as Poupart's ligament. The position of the growth rendered necessary the making of a long posterior flap and prohibited the use of Wyeth's pins for the prevention of hemorrhage. The abdomen was opened and the common iliac compressed by the fingers of a colleague (McBurney's method) while the author performed the amputation. Hemostasis proved very successful and the patient recovered from the operation in a satisfactory manner, but before leaving the hospital there was a beginning recurrence in the neighborhood of the wound. DaCosta says that in another such case he will make his long posterior flap entirely of skin, without any muscle, for he had considerable trouble from the dragging on the sutures caused by the heavy posterior flap, although he had used several button sutures.

Edmund Owen[3] discusses a **case of interscapulothoracic ampu-**

[1] Brit. Med. Jour., Sept. 8, 1900. [2] Am. Jour. Med. Sci., Mar., 1901.
[3] Lancet, Nov. 3, 1900.

tation in which he performed the operation for intractable ulceration following an extensive burn. The patient was a woman aged 28, who had been burned 18 months previously. At the time of admission the ulceration extended over the whole upper extremity from the scapula to the roots of the fingers and also involved a portion of the pectoral region and the axilla. The extremity lay helpless at the patient's side. The various methods of skin-grafting were employed without effect. Removal of the entire extremity seemed to be the only thing to do for the patient, and several months after her admission that operation was performed. The clavicle was divided with a saw and the vessels ligated after some difficulty. The subsequent steps of the operation were easy of accomplishment. Considerable shock followed, but she responded promptly to the intravenous injection of salt solution. The patient made a good recovery. This operation is indicated for malignant disease involving the humerus or scapula, or when there is insufficient covering for a shoulder-joint amputation. It may also be done for certain extensive cancers of the breast. Treves has recently performed the operation in South Africa for gunshot injury. The author knows of no other case in which this amputation has been done for an extensive ulceration. Owen's patient had a narrow chest of the "expiratory type," which, together with the fact that the arm had long hung helplessly at the patient's side, placed the vessels far above the level of the clavicle, making their ligation very difficult. In narrow-chested persons the vessels must be sought at a considerable distance above the clavicular incision. [In this operation ligation of the vessels is more quickly and easily done after the manner of LeConte,[1] who first disarticulates the inner end of the clavicle and divides the muscular attachments along its shaft. This method renders access to the vessels easy. The artery is first tied, the extremity elevated, and the vein ligated. LeConte has recently reported at the Philadelphia Academy of Surgery the death of his patient, which took place 23 months after the operation, from metastasis occurring in the lung.]

Amputation at the knee-joint is discussed editorially in the "New York Medical Record."[2] Amputation at this point differs from that in other parts of the extremity because of the tissues overlying it. When the lower end of the femur is not disturbed, the flap is made so that the cicatrix shall occupy a position behind and above the condyles. The patella may or may not be removed. This operation has several objections; first, sloughing of the long flap may take place, particularly in atheromatous subjects, and again there is always fluid exuded which separates the flap from the articular surface of the bone, and thus healing is delayed and drainage must be kept up for some time. The result is apt to be better when the patella is left. The operation known as Gritti's is more commendable than the foregoing. In this operation the articular surfaces of the femur are removed together with the posterior surface of the patella, which puts two bony surfaces in apposition. A much shorter flap is also made, with consequently a better blood-

[1] Ann. of Surg., Sept., 1899; YEAR-BOOK OF SURG., 1900. [2] Oct. 27, 1900.

supply. [The operation of Gritti is an application of the principle utilized by Pirogoff in the ankle, the sawed patella being applied to the sawed femoral condyles. Ssabanajeff has cleverly modified Gritti's operation. A plate of bone is removed from the tibia and is left attached to the anterior flap, and this is applied to the sawed surface of the femur. The tuberosity of the tibia thus forms the supporting surface of the stump.]

Jonathan Hutchinson, Jr.,[1] thinks the **Syme amputation,** although popular among English surgeons, is not so satisfactory as is generally supposed. When it is successful it gives a most useful stump. The objections lodged against the operation are as follows: (1) The skin of the heel is very troublesome to disinfect, and the vitality of the flap is not good, owing sometimes to the posterior tibial artery being divided before the origin of the calcaneal branches. (2) There is difficulty in fitting the flap, with its central cavity left by enucleating the os calcis, against the perfectly flat surface of the sawn tibia and fibula. (3) It is by no means an easy operation to do well, and the heel flap is apt to be scored and bruised in the necessary dissection. From one or the other of the above reasons perfect union by first intention after Syme's amputation appears to be the exception rather than the rule. The following is an analysis of 27 cases of Syme's amputation performed by different hospital surgeons during the last 9 years—that is, since the antiseptic methods came into vogue: In 3 cases (10 %) the result was complete failure, the flap sloughing away; 1 of these 3 cases proved fatal from septicemia and renal diseases. It should be noted that in this last case—the only fatal one out of 27—the amputation was done for compound fracture of the foot, and its performance was delayed by the patient's obstinacy. In 12 cases either free suppuration occurred with partial sloughing of the flap, or for other reasons the healing was very slow; in one, for example, the patient was in the hospital for 5 months, in another for 3 months; in others sinuses still existed, or the flap was painful and inflamed at the time the patient was discharged. The operation was done for a great number of conditions, and at all ages from 5 up to 60 years. It is probable that most of these 12 patients were ultimately able to bear weight on their stumps, but in some the condition was not promising, and at any rate the percentage of poor immediate results, 45 %, is rather striking. In the remaining 12 cases the immediate result was good, though in several some slight suppuration occurred; at least 5 of the 12 were examples of primary amputation for crush of the foot. It must be said, however, that often the Syme operation is done under the most unpromising circumstances,

Fig. 3.—Stump of subastragalar amputation showing the favorable position of the scar and the broad base of support (J. Hutchinson, Jr., in Brit. Med. Jour., Oct. 20, 1900).

[1] Brit. Med. Jour., Oct. 20, 1900.

conditions which contribute largely to the absence of primary healing. The **subastragaloid amputation** which the author recommends has been employed on 6 occasions with satisfaction both as regards immediate and remote results. In doing the operation he follows closely the lines laid down by Farabeuf. To obtain a good result the tissues of the sole must be in good condition as far forward as the base of the fifth metatarsal bone, so in many instances the operation may be impossible when Syme's method would be possible. Among the advantages over Syme's method are: (1) The stump is about 2 inches longer. (2) The elasticity due to ankle movements is a great help in walking. (3) It gives a broader base for support. (4) The pad on which the patient walks is that on which he always walked, and not that at the back of the heel, as in the Syme operation. (5) Arterial supply of the flap is better. (6) The stump is more adaptable to an artificial foot. The incision is outlined as follows, and the illustrations in many textbooks are said to be misleading: The incision should be made along the outer border of the foot from the fifth metatarsal back to the outer border of the tendo-Achillis, curving upward along the latter and then passing forward a finger's breadth below the external malleolus, across the dorsum of the foot to the extensor pollicis over the scaphoid bone, and then sweeping across the sole with a slight convexity forward. It would be out of place to describe in detail all the steps of the operation, but it may be noted that the flap cannot be too thick; in other words, that everything is taken from the inner and under aspects of the os calcis, and that working from the outer side there is no difficulty in dissecting out the latter bone. The flap seems to be redundant, especially on the dead subject, but it is not really so, and it is most important to have no tension over the

Fig. 4.—Skiagraph from case of subastragalar amputation, taken 1 year after the operation (J. Hutchinson, Jr., in Brit. Med. Jour., Oct. 20, 1900).

head of the astragalus. The plantar nerves and tendons should be dissected out of the flap. The tilting of the astragalus from traction by the tendo-Achillis, as is spoken of by Farabeuf, has not taken place in any of Hutchinson's cases. This should not take place if the flap is long enough and if primary healing takes place. When the condition of the sole will permit of its performance, this operation, if done according to Farabeuf, will prove better than either Syme's or Pirogoff's amputation. The operations in which two lateral flaps, or a large heel flap, or, worst of all, in which a large dorsal flap are employed, are heartily condemned.

Monks [1] reports an interesting case of **avulsion of the little finger** in a child 20 months old. The accident resulted from the finger being caught in a door. With the finger came away one of the flexor tendons, as shown in the accompanying illustration (Fig. 5).

Fig. 5.—Avulsion of the little finger (Monks, in Boston M. and S. Jour., Feb. 28, 1900).

Samfirescu [2] advocates very strongly the **osteoplastic method of amputation of long bones.** By following this method the cut end of the bone is covered by a bone-periosteal flap which unites quickly, preventing growth of the bone after amputation and oftentimes preventing development of a sensitive stump. This method adds considerable time to the operation, but the benefits derived from its employment are such as to outweigh the prolongation of the operation.

Moschcowitz,[3] in discussing the **construction of amputation stumps,** strongly recommends the employment of the **osteoplastic method of Bier,** and reports 2 cases in which he has used this method with satisfaction. He describes minutely the technic of the operation.

H. W. Page [4] reports 2 cases of **interscapulothoracic amputation for sarcoma of the shoulder.** In each case he operated after the method of Berger. Ligation of the vessels after resection of the clavicle was accomplished without difficulty. The first patient died a few months after operation with a secondary growth of the femur and also a local recurrence. The second patient suffered a slight local recurrence about a year after operation. This was removed and the patient was doing well at the time of the author's report.

ANTHRAX, ERYSIPELAS, AND TETANUS.

Bissell [5] writes on the subject of **tetanus following clean operation-wounds** and reports 2 cases. These cases are interesting because

[1] Boston M. and S. Jour., Feb. 28, 1900.
[2] Rev. de Chir., Aug., 1900.
[3] Med. News, Feb. 9, 1901.
[4] Lancet, Feb. 23, 1901.
[5] Phila. Med. Jour., Feb. 16, 1901.

the tetanus developed after primary healing of apparently aseptic wounds. The patients, although being in the same institution, were operated on by different surgeons, with months intervening between the operations, and occupied not only different wards, but different buildings. No association could be found between the 2 cases. The assistants, the nurses, and the instruments were different in the 2 cases. The same man etherized both patients, however, and the catgut came from the same reservoir. The supply of catgut continued in use and the etherizer continued his work and no other cases developed in the hospital, so this possible origin may be ruled out. Case 1 was a woman aged 36 years, who suffered from procidentia uteri, but was otherwise apparently healthy. A slight perineorrhaphy and a double Alexander operation was done. The wounds healed primarily and the patient did well in every respect until the fourteenth day, when she developed some stiffness of the jaws, followed by stiffness of the muscles of the back and extremities. The patient had practically no elevation of temperature. The disease progressed in spite of treatment, and the patient died on the fourteenth day. The treatment consisted of chloral and bromid together with physostigmin. Case 2 was a woman 40 years of age, operated upon for a fibroid tumor, hysterectomy being done. The patient had some fever after the operation, but the wound healed primarily, the stitches being removed on the sixth day. Trismus and rigidity of the postcervical muscles developed on the eighth day. This was quickly followed by general spasms. The patient grew gradually worse in spite of treatment with antitoxin, and died on the day following. Altogether 160 cc. of antitoxin was used, and in addition chloral, bromid, and physostigmin were employed. At times inhalations of chloroform were used to control the convulsions. Before death the patient's temperature rose to 105°. In discussing these 2 cases the author expresses disapproval of such words as "idiopathic," "spontaneous," and "autoinfectious" to describe the cause of tetanus, asserting that these terms are only subterfuges. The life and behavior of the tetanus bacillus is next briefly outlined. Attention is called to the fact that a number of cases have been reported in which spores of the tetanus bacillus have remained latent in the human body for years and finally given rise to the disease. In a case reported by Kaposi the germ entered the body 5½ years previous to an operation which he performed, and which was followed by tetanus. Another notable case was that of a German army officer who received a gunshot injury, but did not develop symptoms of tetanus for 2½ years afterward, when, after a day's hard exercise in stormy weather, the tetanic symptoms manifested themselves. Many other instances are noted in which tetanus developed after aseptic operations and could be traced to infection occurring years before. Morgan reports a case in which a splinter was removed after 2 months because it gave rise to neuralgia, and rabbits inoculated from it died in a few days of tetanus. The belief is expressed that it is possible for these germs to exist in the body without giving rise to symptoms unless the tissue-resistance is diminished by some disease, traumatism, exposure, or oper-

ation. Thalmann has shown by experiments upon animals that the easiest road for the access of the tetanus bacillus is the socket left after the extraction of a tooth. Injections of the bacillus into mucous-lined cavities made by the same experimenter gave negative results. He asserts, however, that the tonsils offer an acceptable road to infection. In discussing his own case Bissell can think of but two origins of the disease; first, through the sockets of several teeth extracted a number of months before the operation; and second, through some defect in the author's disinfection prior to operation. Other patients, however, were operated upon the same day under the same circumstances, and this was the only patient who developed the disease. In considering the treatment of tetanus it is recommended that preventive treatment should be employed whenever there are other cases of tetanus in the hospital or in the neighborhood of the operation; whenever there is a history of exposure to the germ and operation is contemplated; when the wound has become contaminated with earth; or in those districts where tetanus is common. Injection of the antitoxin is harmless if the preparation is reliable and proper aseptic precautions are observed. Tizzoni reports the successful use of antitoxin in 2 students infected by a severe tetanus culture in his own laboratory. Bazy and others have also reported excellent results when the antitoxin was used as a preventive as well as a curative agent. The injections of antiseptic solutions, such as carbolic acid, etc., have not proved satisfactory. Since the antitoxin affects at once the tetanus poison in the circulation, it is unnecessary to reopen wounds for the purpose of disinfecting them, nor is it necessary to amputate parts or excise them for the purpose of eliminating the poison. Since the antitoxin can only affect the poison in the circulation and has no effect upon that already taken up by the nerve-cells, it is quite important that the use of this remedy should be established as soon as possible after the onset of the symptoms. The first injection should be given, if possible, within the first 24 hours. The dose must be large and the material absolutely sterile. The best method of injection is the cerebral, the serum being introduced into the lateral ventricle itself. If subcutaneous or intravenous injections are depended upon the doses must be large. It is recommended that the sedative treatment with bromid and chloral should accompany the antitoxin treatment.

Sydney H. Long [1] reports a case of **tetanus successfully treated with antitoxin.** It has been shown that the cells of the nervous system have a greater affinity for the tetanic toxin than they have for the antitoxin, and that therefore the longer the latter is withheld after the symptoms of the disease present themselves, the less will be the chances of recovery. Long thinks that many of the failures reported from the use of antitoxin in the treatment of tetanus are due to the fact either that the drug has not been used early enough or else has been employed in too small doses. The author's experience with other serums suggests the opinion that much larger doses than are generally recommended might be used. The report of his case is as follows:

[1] Brit. Med. Jour., Nov. 24, 1900.

A lad 13 years of age was admitted to the hospital suffering from local and general spasms 5 days after receiving a lacerated wound of a toe from a nail projecting through the sole of his shoe. The first pain experienced in the wound was 4 days after the receipt of the abrasion. The muscles of deglutition were remarkably free from spasms. The antitoxin could not be obtained immediately on the patient's admission, and therefore bromid and chloral alone were used. On the second day, however, after the patient had had several general spasms, 10 cc. was given subcutaneously and repeated every 4 hours until 12 doses were given, and then the same dose was administered by the rectum every 4 hours for 6 days. After this the antitoxin was given every 8 hours for 3 days and then discontinued altogether. In all, 13 injections were given subcutaneously and 55 by the rectum, making in all 680 cc. of serum. An urticarial eruption appeared about the seat of injection in the loin and spread over the abdomen. It was, however, not accompanied by fever, and disappeared very promptly. After the antitoxin had been used for 3 days the convulsions began to decrease in frequency and severity, and the patient made a slow but satisfactory recovery. The increase in the number of convulsions during the first few days that the antitoxin was used is accounted for by the fact that the prick of the needle oftentimes produced a convulsion. The author thinks that the successful result in this case was due to the large amount of the antitoxin which was used, and that if such doses were employed the need for the intracerebral injection would become less frequent. The rectal injections in this case were given through a flexible rubber tube in about an ounce of pancreatized milk. The rectum was emptied each day by a pint of warm water. [It should be noted that S. J. Mixter reported a case in the "Boston Medical and Surgical Journal," October 6, 1898, to exhibit the value of large doses of antitoxin. His patient received 3400 cc. of serum, or about 285 cc. a day, and finally recovered.]

Hayes,[1] of the British Army, reports a **fatal case of tetanus treated with antitoxin.** The symptoms of the disease developed 9 days after a severe burn of the right hand. While awaiting the arrival of the antitoxin, hypodermic injections of a 1 % solution of carbolic acid were given in 5-minim doses every 3 hours, and in addition chloral was also administered. The antitoxin was given hypodermically 3 days after the symptoms developed. One and a half grams was injected as the first dose. The next day the same dose was repeated; spasms, however, increased, and the patient died on the second day. At the autopsy the brain was found to be very generally congested. The spinal cord was in a like state of congestion. [The author appears to be in the frame of mind of most of us; that is, somewhat disappointed in this drug; but it is only fair to observe that the treatment was instituted late and the dosage was small.]

Before the New York County Medical Society Alexis V. Moschcowitz[2] briefly refers to the **history of the tetanus bacillus,** and says

[1] Brit. Med. Jour., Dec. 22, 1900. [2] Med. News, Oct. 13, 1900.

that since the discovery of the germ it is a mistake to apply such names as "rheumatic" and "idiopathic" to those forms of the disease for which we can find no cause. He thinks it possible for infection to take place through an abrasion of the mucous membrane. The bacillus multiplies only at the point of infection, and the absorption of the toxins here produced causes the symptoms of tetanus. Widal and Schantemesse have both obtained pure cultures of the bacillus from the vagina. In considering the pathology of the disease he says that the changes observed postmortem are not sufficiently uniform to be considered characteristic. The most constant condition is a hyperemia of the nerve centers. The normal brain and cord possess some antitoxic power, and therefore to some extent neutralize the toxins. The portion of the cord most frequently affected is the zone of large cells in the anterior horns. Prognosis depends upon the length of incubation and the acuteness of the disease. The author has collected 290 cases treated with antitoxin by the subcutaneous method, and of these 117 patients died. Forty-eight patients treated by the cerebral injection of antitoxin presented a little over 50% of recoveries. All of the cases, however, were of the severest type, and were considered hopeless. In outlining the treatment it is recommended that the wound should always be promptly enlarged and thoroughly freed of all foreign matter, and then disinfected with some strong antiseptic. The most frequent cause of tetanus in large cities is the toy pistol. In discussing elimination, catharsis and diuresis are recommended. Venesection may also be used, as much salt solution being introduced into the circulation as there is blood removed. Antitoxin should always be employed. The use of the antitoxin as an immunizing agent has shown itself to be of the utmost value. When the symptoms of tetanus show themselves it does not mean the beginning of the disease, but the beginning of death from the disease. The antitoxin has proved its prophylactic power at the Gebaer Anstalt at Prague in eradicating an epidemic of puerperal tetanus. In veterinary practice also this use of the drug has proved eminently satisfactory. Roux and Borrell first suggested the intracerebral injection of antitoxin which recently has given some good results. The use of chloral, bromids, etc., should always be combined with the antitoxin treatment. Since, as has been said, the central nervous system seems to possess some antitoxic power, the injection of brain substance subcutaneously has been recommended. Bacelli's method of injecting carbolic acid is also mentioned.

William H. Park, in discussing this paper, said that at all the places for the manufacture of diphtheria antitoxin the **animals are now immunized against tetanus.** This measure has proved very successful. The use of the antitoxin, however, after the symptoms have once manifested themselves in the animals, is of little value.

Abbe said that last summer he had seen 7 cases of tetanus, and in 5 of the patients, all severe cases, he employed the **intracerebral injection of antitoxin.** Three of the patients recovered, although at the time of operation it was thought that they were all hope-

less. [For Abbe's paper on the subject of intracerebral injections see "Annals of Surgery," March, 1900, or YEAR-BOOK, 1900.] In performing the operation he employs the method of Kocher. The opening in the skull should be very small, and the point of insertion for the needle is halfway between the outer angle of the orbit and the midpoint of a line running across the head and connecting the external meatuses of the ears. Local anesthesia can be used in this operation, since the patient never complains when the needle is introduced into the brain substance. In 3 of the patients the amelioration of the symptoms was nearly immediate. In speaking of the prognosis he thinks that the rule usually set down cannot always be followed, since some cases which begin mildly have severe exacerbations. Abbe predicts a great future for the intracerebral injection of antitoxin.

Converse reported a case of **tetanus occurring** after **frost-bite** in which he employed altogether 720 cc. of antitoxin. The tetanus seemed completely cured when the patient developed pyemia and died. He thinks the pyemia resulted from infected serum, the material having been allowed to remain uncorked for some time.

Ware said that, since **air was the best antiseptic** in case of **tetanus-infection,** the **open treatment of wounds** should be recommended when the presence of this bacillus was suspected. He condemns cauterization because it produces an eschar which prevents drainage and absolutely excludes the air. During the past few years he has treated 11 cases of wounds inflicted by toy pistols with the open method and none developed tetanus.

In closing the discussion Moschcowitz said that of the 38 cases of intracerebral injection which he had been able to collect there had been 1 case in which a **cerebral abscess** had followed this treatment. In this patient the tetanus was cured and the abscess developed weeks afterward. Staphylococcus albus was the microorganism which produced the abscess, and hence the infection was probably due to some defect in the technic. [For report of this case see YEAR-BOOK, 1900.] The greatest care in aseptic technic is urged upon surgeons undertaking this treatment.

Zwar[1] reports a very **severe case of tetanus** occurring 18 days after a **gunshot injury.** When the symptoms developed the wound was thoroughly cleaned under anesthesia, and the treatment, consisting of a combination of bromid and chloral by the mouth and antitoxin subcutaneously, was instituted. The convulsions became so frequent and so severe that the patient had to be kept almost continuously under the influence of chloroform. Five days after the onset of the symptoms 2 injections of the antitetanic serum were given into the **median basilic vein.** This treatment was repeated daily for 3 days and then on each alternate day for a short time. From the time this change in the treatment was instituted the patient began to improve and ultimately he made a good recovery.

[1] Intercolonial Med. Jour., Mar. 20, 1901.

Sawyers[1] discusses very thoroughly and interestingly the subject of the **medicinal treatment of actinomycosis.** He reports 7 cases, in each of which the diagnosis was confirmed by the microscope and in which treatment with potassium iodid proved successful. In considering the disease its history is briefly outlined. The most frequent source of infection is through some abrasion of the mucous membrane of the mouth. In most instances it will be found that the patient has had some association with animals suffering from the disease. In 3 of his cases the patients had been caring for big-jawed cattle. Three cases have been reported in which the disease is supposed to have been communicated by kissing. In studying the morphologic elements of the disease the author found the coccus-like bodies to be much more frequent and characteristic than the club-shaped bodies or the filaments. Actinomycosis has been found to affect nearly every organ of the body. Its most frequent points of origin are the lower jaw, the lungs, and the cecum. The constitutional symptoms of the disease are not very marked unless some pus organism is associated with the ray-fungus. When there is a double infection the temperature is low compared with the local manifestations, which fact the author attributes to an interference with the absorption of the ptomains by reason of the dense infiltration of the tissues. The absence of glandular enlargement is in contrast to the condition found in cases of tuberculosis and carcinoma. The disease is strikingly free from pain and sensitiveness. The author devotes considerable time to the treatment of actinomycosis. Attention is called to the change which has been brought about in the treatment during late years, it having been considered at one time necessary to remove absolutely all of the diseased tissue in order to establish a cure, whereas at present the trend of professional opinion is in the direction of medicinal treatment. Thomasson in 1885 suggested iodid of potash for the treatment of the disease in cattle. The United States Government Commission in 1893 reported 63% of recoveries in the treatment of cattle with iodid of potassium. Beraro reports 25% of cures by the iodid alone and 75% when surgical interference is combined with the iodid. It is thought that the failure of this remedy in the hands of many is due to the want of thoroughness in its administration and to the fact that it is not continued for a sufficient length of time. The actinocladothrix is not destroyed by the iodid, but its growth is retarded. On this account it has been suggested that the iodid aids the phagocytes in their fight against the infection. In the literature of the subject the author has been able to find 63 instances of cure by the iodid and only 2 reported in which it has failed. In the absence of suppuration the disease yields much more readily to the iodid. In his own cases the author has used a 1% solution of the iodid because this strength possesses the greatest osmotic power. This solution is used hypodermatically in doses of 15 minims injected into the infected area.

Clarke[2] reports a **case of anthrax** occurring in a lad 17 years of age. The seat of infection was on the forehead, and resulted in an edema and

[1] Jour. Am. Med. Assoc., May 11, 1901. [2] Lancet, Nov. 10, 1900.

swelling of the face which closely resembled erysipelas. The portion of infected tissue was widely excised and a strong solution of carbolic acid (5%) was injected at 8 or 9 points around the area. The patient made a satisfactory recovery. The diagnosis was not confirmed microscopically, but clinically it seemed certain. Bousfield[1] and Kidd[2] both report cases in which a clinical diagnosis of anthrax was made and a cure obtained after excision. Neave[3] reports a case of anthrax in which death occurred in 4 days. In this case pure cultures of Bacillus anthracis were obtained, and when injected into guinea-pigs produced death from the disease. Campbell[4] reports a case of anthrax in which the bacillus was found and in which the total removal of the diseased area by the Paquelin cautery resulted in a cure.

CYSTS AND TUMORS.

A. E. Halstead[5] discusses at length **carcinoma of the thyroid gland.** The history of this condition is briefly outlined. The most recent contribution on the subject is by Poncet,[6] who reported 50 cases not included in former statistics. The frequency of the disease varies in different localities, it being more frequent in those countries where the benign tumors of the gland are most prevalent. Lücke observed 10 tumors in 2 years at Berne. Limacher, of Berne, in 7641 sections found carcinoma 38 times, while Bhiari, of Prag, found 11 cases in 7700 necropsies. Williams, who has studied the frequency of the condition in the British hospitals, reports only 7 instances in which the thyroid was affected in 7294 cases of carcinoma. The disease is most frequently found to be preceded by a benign growth. Age has little influence on the disease. In Kaufmann's 20 cases the growth appeared most frequently between the fortieth and fiftieth years. Demme reports a case of carcinoma of the thyroid in an infant, and Schuh a case occurring in a girl of 16. Injury is held by some authorities to be an exciting cause of the condition. The medullary carcinoma is the most frequent variety found in the thyroid gland. Pavement-celled epithelioma has been observed by a number of authorities. In this variety of cancer the progress of the disease is slow and the occurrence of metastasis infrequent; hence in these cases the prognosis is more favorable. It is exceptional to find the whole gland involved in a malignant growth. Not infrequently both adenoma and carcinoma are present in the same gland. Although the size of the tumor varies, it is usually small. A number of operators have reported cases in which the thyroid tumor was not suspected until a metastatic growth, because of its resemblance to the thyroid tissue, called attention to this gland as the primary seat of the disease. It is well known that the secondary tumors are of the type of the thyroid growth. Reference is made to tumors occurring in various parts of the body which are composed of thyroid tissue. These

[1] Lancet, Oct. 20, 1900. [2] Lancet, Jan. 26, 1901. [3] Lancet, Oct. 6, 1900.
[4] Brooklyn Med. Jour., Oct., 1900. [5] Medicine, Feb., 1900.
[6] Congres. Français de Chir., 1899; Rev. de Chir., 1899.

growths usually occur when the gland has been removed or when disease has destroyed its function. Metastases are more frequent in the lungs than in the bones. Regional metastases are quite common. The glands along the internal jugular vein and above the clavicle are the first to become involved. Secondary growths may occur in the lungs because of cancer-cells carried through the blood-vessels or from perforation of the trachea by the growth and the aspiration of particles of the tumor. The sternum is the most frequent bony seat of secondary growth. Pulsation is very common in the metastatic bone-tumors, although the primary growth rarely possesses any marked vascularity. Because of the smallness of the tumor and the lack of symptoms an early diagnosis of cancer of the thyroid is difficult, and hence the treatment is often delayed. The following symptoms are enumerated as characteristic of carcinoma of the thyroid: (1) Rapid growth in a goiter that previously remained stationary for some time, especially in a person between the thirtieth and fiftieth years of life. (2) In nearly all cases pain is greatly augmented if the growth becomes malignant. In those in whom no previous enlargement of the gland was noted before the growth of the carcinoma began, pain was present from the beginning and was of severe character. It is usually referred to the ear, teeth, and temporal region. At times it radiates down the arm or is referred to the sternum. In the latter case there is usually a retrosternal tumor, either primary or secondary. In one of Lebert's cases pain in the stomach was a prominent symptom and was believed by him to be due to pressure on the vagus nerve. (3) Tenderness on pressure has been present in nearly all of the cases reported. In nonmalignant struma the gland is not sensitive. (4) All of the pressure-symptoms that may accompany benign growth are usually exaggerated in carcinoma. This is particularly true in the rapidly growing tumors, but is also present in those of small size and slow growth. Dysphagia when a symptom of thyroid enlargement is considered by Lücke as indicating either malignant disease or strumitis. Paralysis of the recurrent nerve is a rare complication of benign goiter, but is common in the malignant form. Dyspnea occurs early, and when the tumor is comparatively small it may result from compression of the trachea; usually from lateral pressure, from bending, or from the growth perforating the walls and filling its lumen. It may also result from metastatic deposits in the lung or from sternal or retrosternal tumors pressing upon the trachea or bronchi. Dyspnea may also follow paralysis of the recurrent laryngeal nerve. (5) Thrombosis of the veins, first of those conveying the blood from the diseased portion of the gland and later of the jugular and cutaneous veins, is a usual accompaniment of cancer of the thyroid. This rarely occurs in benign growths. In carcinoma it is a constant and valuable sign. Kaufmann considers it one of the most reliable indications of malignant tumor of the thyroid. Hahn in a recent paper calls attention to this symptom and reports 2 cases from von Bruns's clinic in which the diagnosis was made of cancer in one and of sarcoma in the other, by excising under local anesthesia a portion of a thrombosed cutaneous vein and submitting it to a microscopic

examination. When thrombosis of the deeper veins is present, metastasis through the vascular system has already occurred, and the disease is no longer amenable to surgical treatment. Resulting from this thrombosis we have edema of the face and neck and occasionally edema of the upper part of the thorax. (6) Enlargement of the lower cervical lymphatics associated with a tumor of the thyroid is strongly presumptive of malignant disease, and speaks for carcinoma rather than for sarcoma. Glandular involvement in carcinoma may occur before the primary tumor is palpable. The glands are as a rule hard and painful on pressure. (7) Fever, either of a continuous or remittent type, was a symptom in the cases reported by Cramer, Poumet, and Kaufmann, and is mentioned by most writers on this subject. The explanation given by Cramer for the continuous fever that occurred in his cases was that foci of degeneration were constantly present, and absorption of these products caused the elevation of temperature. He considers that in the remittent type the rise of temperature is coincident with the beginning of metastatic growths in distant organs. The excision and examination of a thrombosed vein will often conclusively settle the diagnosis. Sarcoma is usually of more rapid growth than carcinoma, involves the whole of the gland, and is unaccompanied by lymphatic enlargement. The **treatment** in all cases is **complete thyroidectomy.** A single bone metastasis is not a contraindication to operation. Secondary growths in the lungs or other viscera are to be looked upon as contraindicating any interference. The results of operative treatment are not particularly encouraging. The immediate mortality is high and recurrence frequent. In the patients reported, however, who have recovered from the operation, life has been prolonged. When the disease has been allowed to take its own course death has occurred in several instances from rupture of the carotid artery.

L. S. Pilcher [1] reported before the Brooklyn Surgical Society, December 4, 1899, a number of operations for **cancer situated high up in the rectum,** and discussed the question of the operative technic in these cases. The first case shown was that of a man of 56, upon whom the author had operated 6 months previously for a cancer situated 2 or 3 inches above the sphincter. Three weeks before the radical operation inguinal colostomy had been performed. The rectum was then removed after the manner of Kraske. The sphincter was not disturbed, but the mucous membrane covering it was removed. The upper portion of the rectum was then drawn down and fixed within the sphincter. During the process of separating the rectum the peritoneum was opened, but no ill effects followed. Since the operation the patient has increased greatly in weight and strength and has resumed his occupation of a woodworker. The patient has considerable control over the bowel, but is obliged to respond promptly to any desire to defecate. The artificial anus in the inguinal region was closed 6 weeks after the removal of the rectal growth. Examination of the growth confirmed the diagnosis of carcinoma. Pilcher then showed a specimen of a rectal carcinoma removed

[1] Brooklyn Med. Jour., July, 1900.

from a man aged 67. The operation performed on this patient was very much the same as that previously described. In this patient, however, the peritoneum was much more freely opened, and he died on the sixth day from peritoneal infection. A third specimen was then shown which had been removed from a woman 63 years old. The growth in this case was situated 2½ inches above the sphincter, and extended upward beyond the reach of the examining finger. A primary colostomy was done. The growth was removed through an incision in the posterior wall of the vagina extending up on either side of the cervix. Considerable difficulty was experienced in controlling the hemorrhage through this incision. The sphincter was retained in this case as in both of the others, and the upper portion of the rectum brought down and sutured within its grasp. Eight months after the operation the patient was in excellent condition with no sign of recurrence. The patient prefers to remain with the artificial anus rather than undergo the operation for its closure. In discussing these cases Pilcher says that his remarks apply to cases of cancer of the rectum in which the disease lies sufficiently high to permit of the preservation of the sphincter. Some of these cases are reached only by a combined attack from within the peritoneal cavity and from below. Bristow demonstrated that the disease can often be successfully removed through the vagina. Pilcher recommends that in approaching the rectum posteriorly the osteoplastic method should be employed. This consists in turning back part of the sacrum and the coccyx and replacing them at the conclusion of the operation. The osteoplastic flap cannot be employed when the growth is situated very high up, because in such cases the rectum cannot be brought down to the anal orifice, but must be fixed in the sacral wound. The author questions the advisability of making a sacral anus, preferring rather, in those cases in which the disease is very high up, to obliterate entirely the lower portion of bowel and depend upon the artificial anus in the inguinal region. When the peritoneum has been injured it is strongly urged that thorough drainage should be employed. To the want of such drainage he attributes the fatal result in the second case reported. When the peritoneum is extensively torn he thinks it a mistake to attempt to close it entirely. Operative infection may be avoided by a previous colostomy, by thorough irrigation of the rectum with antiseptic solutions, and occasionally by packing the rectum with gauze. Reference is made to that method of operating most frequently associated with the name of Quénu, of Paris, in which, after a careful cleansing of the rectum from below, the abdomen is opened, the bowel divided between 2 ligatures, and its mucous coat disinfected. A small opening is then made in the left inguinal region and the upper portion of bowel is brought through this and fixed. The next step consists in the careful separation of the rectum from its attachment after ligation of the inferior mesenteric and both internal iliacs. After the rectum has been separated as far as possible through the abdominal wound, this is closed and the removal completed through the perineum. The ligation of the arteries renders

the latter step practically bloodless. This operation has the advantage of permitting the operator to identify and remove any intrapelvic tissue or glands which may be involved in the disease. Another advantage is the fact that asepsis is easily maintained, unless the bowel is injured during the separation. A. T. Bristow, in discussing these cases, remarked that he doubted the wisdom of closing the artificial anus in the inguinal region after the removal of the rectum, because it is very seldom that sufficient control of the bowel is obtained in the perineum. Another objection to the closure is the irritation which may result from the passage of fecal matter over the bowel below.

John B. Deaver,[1] in discussing **carcinoma of the rectum,** remarks that age is relatively of little importance as an etiologic factor, he having met with the disease as frequently in young adults as in the aged. In no instance has he been able to elicit any history of cancer in the patient's family. A. O. J. Kelly has combined the statistics of various writers and finds that in 1391 cases of carcinoma of the intestines the rectum was the seat of the disease in 988 instances. Sarcoma of the rectum is very rare. Of carcinomas 2 varieties are described—the squamous epithelioma and the cylindric epithelioma. The former presents a small, dry, hard nodule at the mucocutaneous junction. Ulceration occurs late if at all. The majority of carcinomas of the rectum are of the cylindric-celled variety. These growths usually arise from the epithelial lining of the glands, and are appropriately termed adenocarcinomas. In their early stages adenocarcinomas present a more or less circumscribed round or oval nodule which projects into the lumen of the bowel. The growth may confine itself to one side of the bowel, or it may encircle it. Its tendency is to ulceration, and to the examining finger it presents a soft mass with raised and indurated edges. Considerable hemorrhage is apt to result in these cases from ulceration. Occasionally the growth apparently is encapsuled, grows rapidly, and may reach an enormous size. Later this seeming capsule may rupture and the contents be discharged. From its resemblance to brain-tissue this growth is described as an encephaloid cancer. This variety is most malignant. The scirrhous is more common than the encephaloid variety. It is usually situated in the anterior surface of the rectum, is hard, and often not discovered until its growth produces constriction of the rectum. It tends to grow upward rather than downward. Colloid carcinoma differs from the encephaloid in that the mass is more jelly-like in consistence and is pale yellowish in color. The growth is not nearly so malignant as the encephaloid variety. Deaver refers to the importance of bearing in mind the fact that the benign growths of the rectum are very prone to malignant transformation. Also, it must be remembered that in cancer of the rectum the early symptoms bear no relation to the gravity of the disease. Pain is the most constant symptom and is greatest when the growth involves the sphincter. Diarrhea is frequent, and Deaver advises that a digital examination should be made whenever there exists a persistent diarrhea. When the growth is situated high up in the rectum it grows more rapidly and produces

[1] Phila. Med. Jour., Nov. 17, 1900.

early obstruction. In the treatment of rectal cancer Deaver advises his modification of the Kraske operation. When possible he always makes an end-to-end anastomosis of the bowel. When this is impracticable an artificial anus is established in the left iliac region. Curetment, the application of caustics, etc., are palliative and only to be done when the complete operation is impossible. When the growth involves the terminal part of the rectum, including the anus, the diseased portion is removed through the perineum, the healthy bowel being brought down and sutured to the skin. When the growth is situated in the lower portion of the rectum, but does not involve the anus, it is removed through a posterior incision, with resection of the coccyx, and often the last one or two segments of the sacrum. When the growth is situated high up it is excised through the sacral opening and an anastomosis made. Deaver does not think it necessary to open the abdomen and ligate the inferior mesenteric artery, as has been suggested. He did this in one instance, but has never repeated it. In all of the cases of rectal cancer operated upon by the author the patients have recovered. When the tumor occupies a high position it is often necessary to open the peritoneal cavity in order to get above the growth. He has never seen peritonitis follow the operation. He does not approve of doing a preliminary colostomy.

Krochlein [1] reports his investigation of 881 cases of radical operation for **cancer of the rectum,** done for the purpose of discovering the mortality of the operation, the tendency of the disease to recurrence, and the functional results obtained after operation. A cure is said to have been obtained in 14% of the cases and an operative success in 80%. The best functional results followed resection of the rectum with preservation of the sphincter. Kraske reports 120 cases in which satisfactory results were obtained by the sacral method. When it is necessary to open the abdomen in order thoroughly to remove the disease, he ligates the superior hemorrhoidal artery.

Péraire [2] reports an interesting case of intermittent **fibroid polyp of the rectum** in a woman 38 years old. The patient supposed that she was troubled with hemorrhoids, as the growth was protruded from the anus at stool. Finally, during parturition a mass the size of an egg was extruded from the rectum. The patient paid little attention to this until 3 months later, when, because of pain and inconvenience, she applied for relief. The tumor was pedunculated and about the size of an orange. It was easily removed and its pedicle cauterized. Microscopic examination showed it to be a fibroma which is the usual variety of polyp found in adults. In children these growths are usually of a mucous structure. The vascular supply of rectal polyps is copious. These tumors produce few symptoms until they have reached considerable size, when the patient complains of pain and tenesmus, and later blood is found in the stools. Bleeding may be so great as to produce anemia. Digital examination confirms the diagnosis. Occasionally the polyp becomes atrophied and is expelled spontaneously. The weight of

[1] Verhandl. d. deut. Gesell. f. Chir., XXIX. Congress.
[2] Rev. de Chir., June, 1900.

the tumor may produce prolapse of the mucous membrane of the rectum. The prognosis following removal is good, although not quite so favorable in children as in adults. Usually the growth is situated so near the anus that removal through this orifice is easily accomplished. Occasionally, however, its location is so high as to necessitate a celiotomy. It is dangerous to divide the pedicle of these growths without first ligating them, and it is better to cover the pedicle with a flap of mucous membrane.

The report of the Committee appointed in 1898 by the Birmingham and Midland Counties Branch of the British Medical Association to investigate the **cause of cancer** has been presented.[1] This committee has carefully studied the possible causes of cancer in a number of counties in England, and thoroughly investigated the soil and climate of these localities. The area covered by the committee's investigation contained a population of 860,000 persons and presented 5300 cases of malignant disease. The general mortality from cancer was found to be about 0.58 %. In certain well-defined areas the mortality is much higher than in others. Sex was not found to play an important part in bringing about this difference of mortality. It was found that in damp, badly drained, and water-logged areas the mortality-rate was much higher than in the dry and well-drained portions of the country. The committee was much impressed with the occurrence of cancer in certain streets and sets of houses. Some evidence was also obtained to show that cancer might be directly transmitted from one person to another.

J. Collins Warren,[2] in an address before the Maine Medical Association on **the nature and origin of cancer,** deals with the subject in a most interesting and instructive manner. Attention was first called to the great difference in the prevalence of cancer in different countries, the disease being practically unknown in the far west and exceedingly rare in the tropics. In considering this subject Warren gives the prevalence of the disease in nearly every country in the world. It is shown that in countries where cancer is common the disease will be found to occur most frequently in low, swampy regions and to be rarer in the higher and drier portions. In New York State, in 1895, there were 5.3 deaths from cancer to every 10,000 inhabitants. In Massachusetts the rate was 6.4, and in San Francisco it was as high as 7.9. Haviland is quoted as reporting 173 cases of cancer occurring between 1872 and 1898 in a flat country of 60 square miles and containing a population of 12,000. In one village in this area, with a population of 1036, there were 42 cases of cancer within these years. Behla, of Luckau, a town in Germany of 5000 inhabitants, speaks of a wonderful increase in cancer in one of the suburbs of this town containing about 1000 inhabitants, while in an adjacent suburb there was scarcely a case of the disease. Between October 1, 1895, and April 1, 1898, there occurred in this suburb 663 deaths, of which 73 were due to cancer. The majority of the houses in this district had had cancer in them, and on one side of a certain

[1] Birmingh. Med. Rev., May, June, July, 1900.
[2] Boston M. and S. Jour., July 12, 1900.

street cancer had occurred in every house. Some houses had had 3 or 4 deaths from cancer. Within a little over 12 months 10 men had died of this disease in this district. In many of the neighboring villages not a single death from cancer had occurred for 25 years. "Examples of 'cancer houses' could be given in great number, but one or two will suffice. The following case reported by Power is perhaps as striking as any: "Mrs. A., aged 45, lived in a certain house for 13 years, and then died of cancer of the stomach. Mrs. B., aged 47, succeeded to her place, and occupied her bedroom. She lived in the house for 20 years and died of cancer of the liver. Mrs. C., 67 years old, who had lived in the house for 8 years, succeeded to the position previously held by the other 2 women, and to their bedroom, and died of cancer of the breast 8 years after the death of Mrs. B." Notwithstanding certain objectors, Warren thinks that there can be no doubt of the great increase in cancer during the past 50 years. He offsets all objections to this opinion by very convincing arguments. In England and Wales, in a little over 20 years, the cancer-rate among males has been more than doubled, and among females nearly doubled. San Francisco shows a most wonderful increase in cancer. In 1866 the ratio was 15.5 to every 100,000 inhabitants. In 1898 there were 103.6 cases to every 100,000. In Boston the ratio has been trebled since 1863. Many other statistics are given by the author showing the great increase in the frequency of cancer. Under the circumstances he says that one can hardly avoid asking the question whether cancer is or is not an infectious disease. The possible sources of infection, such as water, food, soil, etc., are each dealt with. The occurrence of the disease in animals is also considered. Reference is made to a number of cases in which there seems to be no doubt that cancer has been transmitted by contact. Warren asserts that he has seen the disease transmitted from the glans to the prepuce by contact. So strongly is he impressed with the possibility of infection in this way that in operating for cancer he is particular to avoid touching the disease with the knife-blade and to keep all healthy portions of the wound carefully protected from the cancer. Irritation would seem to play some part in the causation of the disease. In considering the question of heredity, Warren refers to the varying opinions held by the profession, and quoted the following remarkable instance reported by Power: "The father died at 46 with cancer of the breast; a brother died at 65 with cancer of the throat; a second brother died at 25 with cancer under left arm. First sister died at 63 with cancer of the breast; second sister died at 46 with cancer of both breasts; third sister died at 40 with cancer of both breasts; fourth sister died at 54 with cancer of breast; fifth and sixth sisters now living with cancer of the breast." The author discusses the various theories regarding the parasitic origin of cancer, quoting many writers on the subject. The organisms supposed to be the producing cause have been so varied and have possessed such different characteristics when described by different investigators that no definite opinion can be formed. "Of all the experimental work which I have quoted, there are but 2 instances in which a genuine carcinoma

has been produced by inoculating an animal with a culture of the so-called parasite of cancer, and in each of these the final requirement of the Koch law has not been met, namely, that cultures taken from these tumors should reproduce their kind." There is no evidence whatsoever to show that bacteria play any part in the production of cancer. [It is held by some authors that reported instances of contagion are fallacious, the cases being really instances of cell-inflammation and analogous to skin-grafting. The reported cases lack proof that cells were not transplanted. Some of the apparent increase in cancer is undoubtedly due to more correct diagnosis, especially of internal cancer, to frequent exploratory operations, to the greater frequency of postmortem examinations, and to more careful writing of death certificates. Newsholme says that just as death from old age grows apparently less common year by year so cancer grows apparently more common, each conclusion being due to a lessening in the number of indefinite certifications. There is probably a real increase in cancer, but the extent is problematic.]

A. T. Cabot [1] reports a case of **accidental inoculation of cancer in a fresh wound.** The patient was a man aged 59, upon whom Cabot operated in March, 1897, for a cancer situated high up on the anterior wall of the rectum. The growth was removed through a Kraske incision. The patient remained well until the summer of 1899, when there developed a small nodule in the skin cicatrix. This mass was removed together with an area of healthy tissue and a portion of the posterior wall of the rectum. This latter tissue, however, looked perfectly normal. Microscopic examination showed the mass to be an adenocarcinoma with colloid degeneration. The mucous membrane of the rectum showed absolutely no evidence of the disease. The scar in which the recurrence took place was 5 or 6 inches away from the original seat of the growth, and the tissues between have remained perfectly healthy. Attention is called to the fact that the recurrence did not take place in the line of the lymphatic current and there was no lymphatic tissue found in the secondary growth. The patient has remained perfectly well up to the present time. Cabot thinks there is absolutely no doubt as to the cause of this recurrence at a point far removed from the original seat of the disease. The author is confident that the skin was infected during the removal of the cancer. [The fact that the recurrence was not in the normal line of lymph flow does not seem to us conclusive, because, when a lymphatic area is blocked by malignant growth, lymph regurgitation may take place, the lymph flowing in an abnormal direction.]

In a paper read before the Medical Association of the Greater City of New York, W. B. Coley [2] discussed the **relationship between traumatism and malignancy.** The author cites many instances in which there seems to be an undoubted relationship between injury and the development of cancer. In 270 collected cases the disease was preceded by trauma in 80, and in 11.5% of the cases the disease developed within a week after receipt of the injury. Just how injury acts in

[1] Boston M. and S. Jour., May 16, 1901. [2] Med. News, Dec. 8, 1900.

these cases is unsettled. Coley is convinced that cancer is of microparasitic origin and that traumatism excites the organisms to activity. In discussing this paper Farquhar Curtis said that he thought it was a mistake to trust too implicitly to a patient's history of injury. [Many articles showing the increase of cancer in various localities have been recently published. Maeder[1] shows the increase of the disease in Germany. Scott,[2] in discussing the increase and distribution of cancer in eastern Essex, shows that in the decade between 1871 and 1880 the death-rate of cancer was 6.36 out of every 1000 deaths; between 1881 and 1890 it had increased to 7.73, and between 1891 and 1900 it had risen to 8.41. Louis Frank [3] shows the increase of cancer in the city of Louisville, Ky. In the year 1895, out of 3510 deaths, 81 were from cancer. In 1898, out of 3164 deaths, 121 were from cancer.]

Frendweler[4] discusses the question of **fever in cancer of the viscera.** At the Zurich clinic between 1884 and 1898 he collected 475 cases of cancer of the viscera. Of these 189 had fever, and in the large majority of them there was no other possible cause for the elevated temperature than the malignant disease. He thinks that it is only in cases of visceral cancer that fever occurs. The fever increases the gravity of the prognosis.

Stanley Boyd[5] considers very carefully the operation of **oophorectomy in cancer of the breast.** This operation was first suggested by Beatson, of Glasgow, in 1896. The idea was first suggested to him by the fact that farmers spayed lactating cows in order to maintain for a long time the secretion of milk. Boyd submits for consideration a table of 54 cases in which oophorectomy has been done for cancer of the breast. The cases are divided into 2 groups; first, those in which the operation seemed to produce a decided effect, and second, those in which no effect or very little effect was obtained. In the first group life seemed to be prolonged in the majority of cases for at least 6 months. Of the 54 cases, 19 were more or less markedly benefited. Boyd himself has operated upon 13 cases, but obtained his best result in the first case operated upon. The improvement is not due to chance, nor is it due to simply opening the abdomen, as has been suggested. Thyroid extract was combined with the operative treatment in many of the instances, but in his own cases Boyd has never used it and does not seem to think that it plays any part in the improvement. One of the author's cases remained free from the disease for 43 months after the operation. Six of those reported in his table were immune for 2 years and over. All cancers of the breast do not behave in the same way after the operation, nor does the operation seem to affect cancerous growths in other parts of the body. The author suggests oophorectomy in women over 40 with no visceral or bony lesions, who are in fair condition and who have not passed the menopause. The operation must still be considered ex-

[1] Zeit. f. Hyg. u. Infect.-Krankh., Bd. XXIII, S. 235.
[2] Lancet, Aug. 25, 1900.
[3] Ann. of Gynec. and Pediat., Aug., 1900.
[4] Deut. Arch. f. klin. Med., Bd. LXIV.
[5] Brit. Med. Jour., Oct. 20, 1900.

perimental. He considers it quite justifiable to remove the arm in cases of far-advanced carcinoma of the breast when it has become so weighty from edema as to produce pain and be of no particular use.

Herman[1] reports 4 cases of **recurrent mammary carcinoma treated by oophorectomy and thyroid extract.** His first patient was operated upon on March 2, 1897, and is still free from cancer and perfectly well. Each of the other patients has shown considerable improvement as regards the growth of the disease and particularly as regards the suffering. The second patient shows improvement at the end of 2 years after the operation. The third patient is quite comfortable and free from pain 14 months after operation, and the fourth suffers no pain and has shown a decrease of the growth during 13 months since operation.

A successful case of **oophorectomy for mammary cancer** was exhibited to the New York Academy of Medicine, Surgical Section, by Lilienthal.[2] In this case the patient showed a most wonderful improvement after operation. Sufficient time, however, had not elapsed to give any idea as to the permanency of the improvement. Manley, at the same meeting, reported a case in which considerable improvement had followed the operation.

Homer Gage[3] discusses the **results of the operative treatment of cancer of the breast.** In 472 operations done in the clinics of Velpeau and Billroth during the preantiseptic period, the mortality was over 17%; out of 231 antiseptic operations from the clinics of Volkmann, Lister, and Billroth the mortality was 6%; and, combining the results of Halsted, Dobson, Cheyne, and himself, the author finds in 233 cases but 1 death, making the mortality less than 0.5%. It is the incomplete operations which are so frequently done that have brought the operative treatment of mammary cancer into disrepute. The author avoids the use of the term cure in speaking of results, since cancer has been known to recur after such long periods. Verneuil, for instance, reports a case of recurrence 30 years after the primary operation, and Sheild has collected 19 cases in which recurrence occurred from the fourth to the eighth year, and 29 cases in which it took place between the ninth and the twenty-fifth year. Local recurrences follow the incomplete operations, but visceral recurrences are found in those cases in which the disease has been thoroughly removed. The author shows the striking difference between the percentage of recurrences after the modern operation of Halsted and after those which preceded it. After quoting various operators with regard to the period of immunity obtained after operation, the author gives his own results. He has operated 57 times and has had no mortality. Since 10 of these were done in 1899, they are not included in his final summing up. Forty-six of his cases have been traced. Local recurrence took place in 27, which the author thinks is a higher percentage than should have occurred or than will be shown in his later cases. Of the 20 remaining patients, 8 died from cancer of an internal

[1] Brit. Med. Jour., Oct. 20, 1900. [2] Med. News, Aug. 4, 1900.
[3] Boston M. and S. Jour., Aug. 30, 1900.

organ; 2 died over 3 years after operation from other disease and free from recurrence; and 9 are healthy and free from recurrence after the 3-year limit. [The question of late recurrence alluded to by Gage is a very important one. Volkmann's 3-year limit is not certainly accurate. It is true that the great majority of cases which pass the 3-year limit never develop local or regional recurrence. When the 3-year limit has been reached, Koenig estimates that there are 6 chances to 1 that no local or regional recurrence will ever take place. Cheyne thinks the chances are as 17 is to 1. The question is, How many cases that have passed the 3-year limit will be alive in 10 years? Our experience is that few survive. Some of them die of recognized visceral cancer. Many die of some undiagnosticated internal trouble, which is probably cancerous in most instances. This point should be investigated and determined.]

Karl Dahlgren [1] gives **Lennander's method for removing cancer of the breast.** This method is as follows: Incision from the ensiform to just below the head of the humerus; dissection of the inner flap clearing the subcutaneous fat, the pectoralis major, and the fascia of the pectoralis minor; next entering the axilla and clearing it of fat and glands. The mass is now attached to the skin of the outer flap only and a curved incision severs it from the body. The supraclavicular fossa is only opened when glands are palpable. He claims to be able, by the above method, to manage the vessels and nerves better, that the operation is drier, and that fat, glands, muscle, fascia, and breast can be removed in one mass. Of 60 cases done more than 3 years ago, 1 was fatal from operation, 26 subjects are living and well, 24 died from external recurrences, and 12 are dead from accidental or unknown causes.

C. A. McWilliams [2] gives the statistics of 100 cases of **cancer of the breast:** Trauma present in 44.6%; married, 74%; children born to 66.6%; average number of children to each, 5; pain present in 56.2%; nipple retracted in 45.2%; right breast involved in 51 cases; left, in 49 cases; axillary glands palpable in 48.9%; axillary glands found cancerous by microscope, 78.6%; average age, 49 years 6 months and 26 days; mortality of operation, 4%; average time in hospital, 20 days; prolongation of life for 1 year, 59%; prolongation of life for 2 years, 36%; cured (no recurrence after 3 years), 34%; recurrence in 1 year, 21 cases; recurrence in 2 years, 28 cases; recurrence locally, 15 cases; recurrence in lung, 6 cases; average length of time in recurrent cases from operation to death, 1 year 2 months and 20 days; average length of time from period of recurrence to death, 5 months.

Robert Behla [3] considers heredity, marriage between relatives, and infection from what will ultimately be found to be a plant fungus, to be important factors in the **etiology of cancer.** He regards stagnant water as a domicile of the cancer-germ and advises the boiling of all water before use in localities where cancer is endemic.

[1] Gaz. des Hôp., Apr., 1900. [2] Med. News, Apr., 1900.
[3] Deut. med. Zeit., June 4, 1900.

Arthur E. Barker [1] in a clinical lecture talks on the **expectancy of life in cases of cancer of the breast.** In the treatment of this condition the author first lays down the following axioms: "(1) An excision of the breast to be effectual must be early. (2) The overlying skin, subcutaneous fat, pectoral fascia, axillary fat and glands with the entire breast must be widely and deliberately removed. (3) During this dissection all division of carcinomatous tissue should be avoided, and if inevitable freshly sterilized instruments, etc., must be used. (4) As little direct handling of the parts to be removed as possible should take place. (5) Arrest of all immediate bleeding should be accomplished preferably by forcipressure, and if not by ligature and subsequent oozing by elastic pressure and bandaging. Rest for the wound and the patient should be secured for at least 2 weeks. (6) All this extensive removal can be accomplished with but little risk to the patient in fairly early cases. (7) When the disease has infected the muscles palliation alone can be expected from surgical interference, and it is questionable whether very extensive operations involving risk from shock ought to be performed with only this end in view. Indeed, the apparently paradoxical rule (which for my own part I have followed of late) appears to be justified—viz., that the more localized the primary focus of carcinoma in the breast is, the more wide-reaching should be the excision on the above lines. That is to say, there is in such cases a fair prospect of complete eradication of the disease by a wide-reaching operation, and therefore it is justifiable to run some risk of shock. The converse rule appears also to have much to recommend it—viz., that the more wide-reaching the disease the more clearly should the operator keep mere palliation in view and by limiting his operation avoid the risk of extreme shock." The author then reports his own results in 100 consecutive excisions of the breast: Ninety were done for malignant disease, 9 for nonmalignant disease, and 1 doubtful. Five of these patients died, 1 from each of the following causes: pyemia, septicemia, cellulitis, syncope, and pleurisy. In the death from pleurisy there had been no injury to the pleura during the operation. One of the author's patients has lived 14 years; another, 10; 2, 8; 4, 7; and 6, 4 years after without recurrence. Altogether, 16 % lived over 5 years and 33.7 % over 3 years. In only 7 instances did local recurrence occur. This latter fact is emphasized because a local recurrence gives rise to a great deal more suffering on the part of the patient than a visceral recurrence. It is thought that with earlier diagnosis and continued improvement in surgical technic the mortality from this disease may be made still less. [Barker's figures touch upon the question alluded to in our note to Gage's paper. One of his patients has survived 14 years, another 10 years. These cases show that absolute cure is probably obtained in some cases. The operation is amply justified by the prolongation of life obtained and the ease gained even if but few live for 10 years.]

George F. Shrady, [2] in urging upon the general practitioner the great importance of **early diagnosis of mammary tumors,** discusses in

[1] Lancet, Sept. 6, 1900.

[2] N. Y. Med. Rec., Jan. 26, 1901.

detail the differential diagnosis between cancer and other tumors of the breast. Dimpling of the skin over the growth is cited as among the early symptoms of cancer, and the author thinks it of the greatest significance, coming on, as it often does, before any retraction of the nipple is observed. This symptom is not absent even in deep-seated cancers. The "tumor test" of stroking the breast with the flat of the hand while the patient is recumbent will always reveal the presence of a growth. This sign, together with the dimpling of the skin and darting pains, is in Shrady's experience the earliest symptom of cancer of the breast. The author emphasizes the fact that no mammary tumor should be left to itself, since the chances of malignancy or of malignant change are very great. One should be very careful in making a diagnosis of "simple tumor." The author thinks that 90 % of breast tumors in old women are malignant.

Frederick Shimonek [1] reports an interesting case of **branchiogenic carcinoma** which he believes to have been primary. The patient was a man 49 years old, who 4 years previously had had an epithelioma successfully removed from his lower lip. There was no return of this growth nor was there any subsequent glandular involvement of a cancerous nature. Four years after this operation the patient developed a large, smooth tumor in the cervical region, which upon opening proved to be a branchial cyst the walls of which showed epitheliomatous growths. The cyst was so large that removal was impossible and the patient died subsequently of hemorrhage.

Loos [2] gives the results of a study of 565 cases of **cancer of the lip** treated in von Bruns's clinic. His work is a continuation of that of Wörner, who collected the cases occurring between 1843 and 1884, which numbered 305. In bringing the statistics up to the year 1898 Loos has added 260 additional cases. In the 565 cases the upper lip was the seat of disease in only 31, and the patients were females in only about 15 %. The age of the patients varied from 22 to 80 years, the average being 60 years. The disease did not seem to grow any more rapidly at one age than at another. The use of the pipe does not appear to bear any relation to the occurrence of the disease. Of the cases, 63 % occurred in agriculturalists. Heredity does not seem to play any part in the production of the disease. Slight antecedent trauma is found to be very common. Submaxillary glandular involvement occurred in about 75 % of the cases and took place usually in from 3 to 6 months. Visceral metastases were rare. Operation was performed in 484 cases of disease of the lower lip and in these recurrence took place in 33 %. Only one-tenth of the relapses occurred within 3 years. Operation upon recurrent growths gave favorable results in 11.7 %. The mortality of operative treatment between 1843 and 1884 was 6.2 %. From 1885 to 1898 it dropped to 0.4 %. The favorable results during the first period amounted to 51.6 % ; in the second period it had risen to 66 %.

[1] Phila. Med. Jour., Jan. 5, 1901.
[2] Beitr. z. klin. Chir., 1900, Bd. CXXVII, S. 57.

Czerny [1] urges upon the surgeon the careful consideration and **treatment of cases of inoperable malignant growths.** Frequently the surgeon, when he finds that a case is beyond operation, loses all interest in it and in many instances is ignorant of the proper method of palliative treatment. The author shows the great relief, both mental and physical, which accompanies such palliative operations as gastroenterostomy, colostomy, etc., in cases of inoperable cancer. In many cases of external malignant growth relief from suffering will follow such palliative measures as curetment, cauterization, the application of formalin or of an antiseptic powder. Czerny believes that the systematic work being carried on at present in many laboratories will finally result in the discovery of the source of cancer and the means of eradicating it.

W. B. Coley [2] reports the **late results of the treatment of inoperable sarcoma with the mixed toxins of erysipelas and Bacillus prodigiosus.** The author has no change to recommend in the use or preparation of the toxins. The results have been much better in the spindle-celled sarcomas than in any of the other forms. The use of the toxins in the round-celled sarcomas has, however, been of sufficient advantage to make it advisable to employ this form of treatment in every inoperable case. When no improvement follows 3 or 4 weeks of daily injection of the toxins, the treatment is not likely to be successful. If improvement occurs, the treatment should be kept up until the tumor has entirely disappeared or until the injections have apparently lost their effect. In moderate doses the toxins may be employed for long periods without danger. It must be remembered that the treatment is recommended only in inoperable cases of sarcoma. The cures from this treatment vary from 4% to 5% in the round-celled to nearly 50% in the spindle-celled variety. Although he has employed the treatment in about a dozen cases of melanotic sarcoma, no success has followed. Lymphosarcomas of the neck have also shown themselves refractory to the toxins. Sufficient inhibitory action has, however, been observed, to justify the employment of the treatment in all such cases. If generalization has occurred the toxins are without value. Fowler, of Brooklyn, does, however, report a case of melanotic sarcoma of the tonsil in which the patient was cured by the mixed toxins. Coley is able to report 16 cases in which the patients have remained well from 3 to 8½ years. The diagnosis in all but 2 of these cases was confirmed by the microscope. Two of these cases were sarcomas of the parotid gland, in which operative treatment is so unsuccessful. The author refers to a physician whom he has treated with the mixed toxins at varying intervals for more than 2 years. The patient has remained well over 6 years since the beginning of the treatment. In this case the growth was situated in the soft parts of the chest, and although of the spindle-celled variety, it was becoming more mixed with round cells and more vascular. Repeated recurrence had taken place after operation. The only cases of carcinoma in which the toxins would seem to be indicated are those in which the treatment is used after primary or secondary

[1] Centralbl. f. Chir., No. 28, 1900. [2] Phila. Med. Jour., May 25, 1901.

operation as a prophylaxis against recurrence. The action of the toxins is only explicable upon the theory that sarcoma is the result of some infectious microorganism.

In a discussion before the Société de Chirurgie de Paris Peyrot [1] reports an interesting case in which **hydatid cysts** were found in the omentum and walls of the pelvic cavity following the rupture of a primary cyst of the liver. He expressed the opinion that this infection of the peritoneum was the result of the rupture of the original cyst, the effused parts containing scolices. Potherat did not think that the author's theory regarding the secondary growths was a proper one. He maintained that when these growths occur in different situations they are not the result of inoculations of the contents of a primary cyst. Quenu, Broca, and Tuffier all agreed with Peyrot that the daughter vesicles of a ruptured hydatid cyst may set up secondary growths at distant points.

Smith and Macready [2] report an interesting case of **hydatid cyst of the liver** recurring after an interval of 10 years in the pleural and peritoneal cavities. In this case repeated tappings of the pleural cysts resulted in temporary improvement. Finally a large cyst was evacuated in the pelvic region. After prolonged drainage of the various cysts the patient recovered. Considerable difficulty was experienced in locating and evacuating the pleural cysts. The patient has remained well 12 months since his discharge from the hospital.

Davis [3] reports a case of **suprahepatic hydatid cyst** in which there was a marked decrease in the secretion of urine, associated with menorrhagia and slight swelling of the legs. These symptoms are attributed to pressure upon the vena cava. Drainage of the cyst resulted in a cure.

Buchanan [4] shows by the report of a case of **hydatid cyst** occurring in a native of India that this disease is not without occurrence in that country, as has so frequently been asserted. The patient had never left his native land.

Fowler [5] reported a case before the Brooklyn Surgical Society of **echinococcus cyst** in which the growth was attached to the under surface of the liver. The weight of the growth produced ptosis of the liver. The symptoms produced were such as to make the operator suppose that he had to deal with a floating cystic kidney. The cyst was removed together with a section of the liver without rupture. The liver wound bled considerably, but was controlled by packing. The patient made a complete recovery.

Clayton,[6] of the British Navy, gives an account of an interesting **hydatid cyst of the liver** which was diagnosticated by the presence of the daughter cysts in the stools. In this case Clayton thinks there can be no doubt, from the symptoms resembling biliary colic, followed by a temporary jaundice, and the presence of the daughter cysts in the stools, that this cyst was situated in the liver and by pressure ruptured into the biliary passages. The jaundice and colic symptoms are explained by

[1] Bull. et Mém., Nos. 9, 10, 11, 1900.
[2] Lancet, Oct. 20, 1900.
[3] Lancet, Oct. 6, 1900.
[4] Lancet, July 1, 1900.
[5] Brooklyn Med. Jour., Jan., 1901.
[6] Lancet, Sept. 15, 1900.

the passage through the ducts of portions of the cyst contents. No leukocytosis, showing ulceration or suppuration, was present at any time. Upon the patient's return to duty he was in good condition, although his liver was slightly enlarged.

Marmaduke Sheild [1] reports 4 **interesting and unusual cases of sarcoma.** The first case was that of a man of 40, who developed a swelling in the lower portion of the thigh. This was incised by his attending physician and found to contain blood. A diagnosis of sarcoma was consequently made. When Sheild saw the case subsequently there was every evidence of an extensive inflammation about the swelling, and an incision evacuated a large quantity of pus. He concluded that the first diagnosis must have been an error, and was surprised to find later, after all drainage had ceased, that the swelling continued. A second operation revealed material which seemed sarcomatous and which proved to be such upon microscopic examination. In the first instance, the author was misled by the pus, which evidently had resulted from an infection of the growth at the time of the early incision. The second case occurred in a man aged 49. This patient presented what apparently was an ulcerated corn on his fourth toe. This declined to heal although treated in many different ways, and amputation of the toe was finally done. Three months after the operation the patient presented himself with an enlarged gland in the groin, which he would not allow to be removed. Subsequently, however, this grew to a considerable size and he consented to operation. The growth was found to be a melanotic sarcoma. Sheild could find nothing in the toe at the time of operation to suggest any melanotic condition. The third case occurred in a woman aged 41, and here all the symptoms pointed to an abscess over the upper portion of the tibia. The tumor, however, was cautiously punctured and found to contain only blood. Examination of the growth after amputation showed it to be a myeloid sarcoma. The fourth case is that of a man of 40, who complained of pain about the back and left side, which coursed over the buttock and down the left thigh. A diagnosis of rheumatism was made and various antirheumatic treatments were instituted without benefit. After observing the case for some weeks, it seemed as though the patient might be suffering from a deep-seated spinal abscess. About this time, however, the patient called attention to a swollen left testis which had been present, but not painful, since the onset of his symptoms. Sheild thinks that this was undoubtedly a case of primary sarcoma of the testicle with retroperitoneal metastasis.

G. A. Syme,[2] of Melbourne, reports a case of **sarcoma** in a woman aged 36, in whom the growth presented externally on the left side in the axillary line over the eighth and ninth ribs. When removal was undertaken it was found that the growth extended between the ribs and involved the pleura, the diaphragm, and the spleen. During the operation the pericardium was exposed upon separation of the growth from the

[1] Lancet, Oct. 27, 1900.
[2] Intercolonial Med. Jour. of Australasia, Aug. 20, 1900.

pleura. The diaphragm and spleen were divided with the Paquelin cautery. It was impossible to remove all of the growth, but the portion which was not removed was ligated in the hope that it would slough off if the patient recovered from the operation. The whole wound was packed with gauze. Suppuration occurred and the remaining portion of the tumor sloughed. Since the operation the patient has been able to go about and has gained strength and health. The wound has entirely healed.

Leonard Freeman [1] reports a case of **periosteal osteosarcoma involving the upper extremity of the femur.** The growth extended well into the pelvis, where large masses could be felt above Poupart's ligament. The skin of the anterior surface of the thigh was also extensively involved. The limb was removed at the hip-joint with the involved portion of the pelvis. The flap had to be made entirely from the posterior surface of the thigh. The common iliac artery was ligated extraperitoneally and the pelvis entirely cleared of all the enlarged glands and portions of the growth. The wound healed well and the patient was out of bed within 3 weeks. Sixteen months after the operation there was no evidence of any recurrence.

M. H. Richardson [2] writes on **suddenly developing obscure non-traumatic tumors of the lower abdomen** and illustrates his remarks with a number of instructive cases. He refers to a patient in whom nothing could be found in the pelvis upon examination under ether. Two days later, when the patient suffered a collapse with sharp pain in the pelvic region, an examination was made, but again it revealed nothing. Three weeks later the patient developed symptoms of acute appendicitis and examination revealed the presence of a large ovarian cyst with a twisted pedicle. That nothing was found at the previous examinations was due to the fact that the cyst was flaccid; later its pedicle became twisted and hemorrhage occurred into the cyst cavity, making its detection an easy matter. Richardson refers to the frequency with which a distended bladder is mistaken for a tumor. Dilation of the colon and its sudden disappearance frequently cause confusion. The practical conclusion which the author draws from a discussion of these cases is that when a patient complains of a severe pain in the lower abdomen, accompanied by symptoms of shock and a tumor is demonstrable, exploratory operation is immediately demanded. It is a mistake in these cases to waste valuable time in trying to make an absolutely correct diagnosis of the condition.

Lexer [3] reports a case of **fibroma of the mesentery** upon which he operated. Before operation the tumor seemed to be the size of a child's head, was spherical in shape, extending as high up as the umbilicus and apparently down into the pelvis. Although only slightly movable before an anesthetic was given, under chloroform it was extremely mobile. When the abdomen was opened the tumor was found to be completely invested by mesentery, having a distinct pedicle, however,

[1] Ann. of Surg., Mar., 1901. [2] Boston M. and S. Jour., Oct. 4, 1900.
[3] Berlin. klin. Woch., No. 1, 1900.

near the spinal attachment of the mesentery. As the operator thought the tumor was not an innocent one, it was removed with its mesenteric capsule and about 6 feet of small intestine. Intestinal anastomosis was performed and the patient made an excellent recovery. The tumor weighed 5 pounds and measured 9¾ inches in width. Microscopic examination showed it to be a pure fibroma with spots of mucoid degeneration.

Burrell [1] reports a case of **multiple plexiform fibromas** occurring in a girl aged 10 years. The child's mother is supposed to have suffered from syphilis, and her father died of tuberculosis. The iodid treatment was tried for some time before resorting to operation. The accompanying illustrations (Figs. 6, 7) show very well the appearance of the leg, which was the part affected, before operation, and also the growth after removal. The case belongs to the class described as neuroma cirsoideum, plexiform neuroma, or Ranken neurom. Burrell thinks that many of these cases are diagnosticated as congenital elephantiasis. Bruns says that the most frequent seat for these tumors is the temporal region or the nape of the neck. As a rule there is not more than one conspicuous tumor, but usually other smaller ones can be found under the skin following irregularly the nerve trunks. The tumor may lie beneath as well as above the fascia. It has been shown to be a disease of hereditary origin, usually fatal, and manifesting itself at birth or shortly afterward. The growths themselves produce apparently no symptoms, and, strange as it may seem, no interference with nerve function unless they involve the spinal canal or cranium, which is rare.

Fig. 6.—Multiple plexiform fibromas (Burrell, in Boston M. and S. Jour., Apr. 4, 1901).

[1] Boston M. and S. Jour., Apr. 4, 1901.

Francis H. Williams [1] asserts that he has had very satisfactory results from the treatment of **skin cancer by the Röntgen rays.** He has not found it necessary, as others have reported, to produce an x-ray burn in order to accomplish improvement in the tumor. In a large number of cases the "foul and nearly unbearable odors cease, the discharge becomes less, and the growth steadily diminishes in size." The earlier the treatment is instituted the better the results. Williams thinks that the curative effect of the x-ray will probably be limited to the cases of superficial cancer, but in those more deeply seated a great deal of pain and discomfort may be relieved by this treatment.

Fig. 7.—Multiple plexiform fibromas (Burrell, in Boston M. and S. Jour., Apr. 4, 1901).

Hudson [2] reports 2 cases of **carcinoma of the vermiform appendix.** One was a case of primary carcinoma found during an operation for retroflexion of the uterus. It was densely adherent and lay in the pelvis. The middle third was obliterated by the new growth; the outer third was dilated. The appendix contained a concretion. Microscopic examination demonstrated the growth to be a carcinoma originating in Lieberkühn's glands. Only 3 cases of indubitable carcinoma of the appendix have been reported. Gifford has recorded a sarcoma surrounding a concretion in the appendix. The second case was a secondary carcinoma discovered during an operation for ovarian carcinoma. There was also a mass at the pylorus, and the broad ligament was studded with nodules.

ANESTHETICS.

Thomas R. Brown and Howard A. Kelly [3] discuss the combination of **nitrous oxid and ether as an anesthetic.** So much were they impressed by the demonstrations of Dr. Goldan and others in the use of this combination that they have employed it in between 200 and 300 cases in Dr. Kelly's private hospital with the greatest satisfaction.

[1] Boston M. and S. Jour., Jan. 17, 1901.
[2] Johns Hopkins Hosp. Bull., July-Aug., 1900.
[3] Phila. Med. Jour., Nov. 3, 1900.

With increased experience the possible disadvantages of this method greatly decrease. This is particularly true regarding the cyanosis produced by the nitrous oxid, and also applies to the postoperative nausea. Unconsciousness from the use of the nitrous oxid gas was produced in from 1 to 2½ minutes and complete anesthesia in from 2 to 5 minutes. They use the Bennet instrument until complete anesthesia is produced, after which an ordinary cone is employed. So much are they in favor of this method of producing general anesthesia that they strongly recommend it to the profession.

Hewitt [1] thinks that Clover's method of producing general anesthesia, consisting in administering first **nitrous oxid and then ether,** is by far the most satisfactory. There are two factors at work in producing the anesthesia; first ether, and second a certain amount of asphyxia, the latter being the result of allowing but a very small amount of oxygen to enter the lungs. Hewitt uses an inhaler (see Fig. 8) after the pattern of Clover's, excepting that the caliber of the tubes is much larger, the author maintaining that this eliminates to a great extent the cyanosis and stertor which accompany the administration of nitrous oxid and ether. Deep and obstructive stertor is considered a danger signal and an indication for the administration of oxygen. In all methods of anesthesia the face should be turned to one side; the dorsal position with the face looking upward is improper in any instance. In using this method the patient is allowed to breathe the nitrous oxid gas until partly under its influence, and then the ether reservoir is filled. The author also commends the use first of the gas and then ether and finally chloroform. The gas makes the anesthetization easier and pleasanter for the patient. The ether can be administered during the chief part of the operation, and gives the anesthetist little uneasiness, whereas chloroform produces greater quiet

Fig. 8.—Ether being introduced during the inhalation of nitrous oxid (Hewitt, in Lancet, Mar. 30, 1901).

[1] Lancet, Mar. 30, 1901.

and muscular relaxation, and during its administration there is also a comparative freedom from venous engorgement. The danger from chloroform is during the second stage,—that of excitement,—which is avoided by the employment of the foregoing method. The disagreeable after-effects of ether are also avoided by this triple combination. Before beginning the chloroform it is well to allow the patient to recover sufficiently from the ether, to cough and thus rid the larynx of any mucus that may be present. The combination of these anesthetic agents is highly commended in operations about the mouth, throat, and nose, and in such cases the Junker inhaler is used.

Prescott LeBreton[1] relates the **history of nitrous oxid gas and ether anesthesia.** While resident physician in the Roosevelt Hospital the author saw this method employed in over 200 cases and was greatly impressed with its utility. The Goldan apparatus was employed in these cases. This apparatus differs from the others in that its valves are nonperishable and allow ether to be given with the gas before the narcosis is complete. The advantages of the method are considered to be: (1) Comfort to the patient. Any one once having been anesthetized by this method objects to a subsequent anesthetization with ether alone. (2) Greater freedom from mucous secretion. (3) Less ether is required, 2 ounces being enough for most major operations. (4) The lessened possibility of kidney complication, owing to the small amount of ether inhaled. (5) The author also claims for this method that after the apparatus is purchased it is cheaper than when ether alone is used. (6) Some authorities assert that alcoholics are more easily anesthetized in this way than by ether alone. (7) It is a great time-saver. (8) With a little care the mastery of administration is easily accomplished. (9) The author has seen but one death reported from this method, and considers it therefore safe. The objection most frequently urged against the method is the "close" inhaler, which it is said causes the patient to breathe repeatedly the same air.

Galloway[2] reports 50 cases in which he has used **nitrous oxid as an auxiliary to ether and chloroform.** The author expresses great satisfaction in the use of this method.

Bird,[3] in a letter to the "Lancet," says that in **administering nitrous oxid gas** it is a great mistake to advise the patient to "breathe deeply" or "to take a deep breath." He describes this advice as "pernicious." The great object is to make the patient forget entirely his breathing.

Evans[4] records a **death from nitrous-oxid anesthesia.** The patient was a female 5 years of age, and the operation was for adenoids. The patient had only inhaled the gas for about a minute and a half when she ceased to breathe. Artificial respiration and stimulation had no effect. The author thinks that the patient had recently suffered from diphtheria, and that cardiac paralysis was partly attributable to this.

[1] Buffalo Med. Jour., Sept., 1900.
[2] Chicago Med. Recorder, 1900.
[3] Jan. 5, 1901.
[4] Pediatrics, Dec. 1, 1900.

Edward Adams[1] discusses **anesthesia by the M. S. mixture,** which consists of 57 parts of ether and 43 parts of chloroform. He claims that when this combination is used the stage of excitement and struggling is not marked; that only 5 to 10 minutes are required to get the patient under the anesthetic; that it is pleasant to take, and that it is comparatively safe.

W. Reinhard[2] attributes a great number of the **pulmonary troubles following anesthesia** to the large amount of mucus and saliva which is secreted, and recommends a combination of morphia and atropia administered ¾ of an hour before anesthesia is begun. [We are of the opinion that much of the pulmonary trouble following anesthesia is attributable to exposure and wetting of the patient on the operating table and to moving him through cold halls without sufficient covering. It is also an established fact that susceptibility of the tissues to microbic infection is greatly enhanced by reducing the body-temperature. Of course, in operations about the mouth and air-passages aspiration pneumonia may occur.]

Hoffmann[3] recommends that in beginning the administration of an anesthetic the **patient be instructed to count,** and particularly to count backward, as this requires considerable mental concentration and also insures regular respiration.

Freyberger[4] reports the case of a patient in whom **Prus's method of resuscitation in chloroform toxemia** was employed. The patient was a laborer, 27 years old, upon whom the operation of stretching the sciatic nerve was about to be performed. At the time of the incision the patient showed some consciousness, and when a little more chloroform was given he suddenly became asphyxiated. From this the patient recovered after artificial respiration. More chloroform was given and the operation was proceeded with. Within a few minutes respiration again failed and all methods of resuscitation proved futile. The trachea was opened and air forced into the lungs, but this proved ineffectual. Prus's method of cardiac massage was then decided upon. The third and fourth ribs were divided close to the sternum and 2½ inches of each reflected with the flap. The hand was then introduced into the thorax and rhythmic compression of the heart made. This was followed in a short time by a spontaneous contraction, but was accompanied by no spontaneous respiration until an hour after cardiac compression had been commenced. Within 3 hours, however, breathing was deep and regular. During this time the patient remained absolutely unconscious and required at times artificial respiration and compression of the heart through the wound. Shortly after this respiration again ceased. The patient, however, lived for some time, the heart gradually failing. Throughout the latter part of life the patient did not make a single voluntary respiration. During the operation of opening the chest the pleura was injured and it was a question whether pneumothorax resulting from this might not have contributed to the respiratory failure.

[1] Med. News, Jan. 9, 1901.
[2] Centralbl. f. Chir., Mar. 16, 1901.
[3] Centralbl. f. Chir., Jan. 19, 1901.
[4] Treatment, Jan., 1901.

Krönlein,[1] at the Thirtieth Congress of the German Surgical Association, presented a tabulated list of **resections of the lower jaw** which tended to show that former results of this operation were more favorable than those of the present day. This fact is attributed to **anesthesia,** since many of the cases die from bronchopneumonia due to inspiration of blood. Krönlein has ceased to use anesthesia in this operation. Of 35 patients operated upon without an anesthetic only 1 died, and the cause of death was meningitis.

The report of the **committee** appointed by the **British Medical Association** in 1891 for the purpose of investigating the clinical evidence with regard to the **effects of anesthetics** upon the human subject, and especially the relative safety of various anesthetics, has been at last completed. The conclusions of this body have been reached after a careful consideration of 25,920 cases. Chloroform was employed in 13,393; ether in 4595; nitrous oxid in 2911; gas and ether in 2071; A. C. E. mixture in 678; nitrous oxid with oxygen in 597; chloroform and ether in 418; chloroform followed by A. C. E. mixture or some other similar mixture in 275; and A. C. E. mixture followed by ether in 155. The uncomplicated cases amounted to 25,163, and those in which unusual symptoms either accompanied or followed the anesthesia number 733; 29 deaths are recorded, 18 of these occurring during chloroform-anesthesia. In 3 of these cases the death is attributed entirely to the chloroform, in 4 to the chloroform primarily, but secondarily to the patient's condition; in the rest the responsibility of the death is divided between the anesthetic, the patient's condition, and the operation. In the deaths from ether not one is attributed entirely to the anesthetic. The conclusions reached by the committee are as follows:

"*Relative Safety of the Various Anesthetics.*—(I) The relative safety of the various anesthetics may be gathered from the statistical tables in the report. When only those cases of danger which were held to be due entirely to the anesthetic are considered, the following instructive figures are obtained, further emphasizing the danger of chloroform as contrasted with ether: Cases of danger (including deaths) considered to be due entirely to the anesthetic: Under chloroform, 78, giving a danger-rate of 0.582%. Under the A. C. E. mixture, 1, giving a danger-rate of 0.147%. Under mixtures of chloroform and ether, 2, giving a danger-rate of 0.478%. Under the A. C. E. mixture followed by chloroform, 1, giving a danger-rate of 1.694%. Under chloroform preceded by ether, 5, giving a danger-rate of 2.2%. Under chloroform followed by mixtures of alcohol, chloroform, and ether, 1, giving a danger-rate of 0.36%. Under ether, 3, giving a danger-rate of 0.065%. Under 'gas and ether,' 2, giving a danger-rate of 0.480%. Under ether preceded by chloroform, 1, giving a danger-rate of 0.480%. Under ether preceded by the A. C. E. mixture, 0. Under the chloroform group of anesthetics (addition of the first 6 headings above), 88, giving a danger-rate of 0.584%. Under the ether group of anesthetics (addition of the last 4 headings above), 6, giving a danger-rate of

[1] Am. Med., May 4, 1901.

0.085 %. (II) Although (excluding nitrous oxid) ether may be accepted as the safest routine agent, certain circumstances determined by the state of the patient, the nature of the operation, etc., may render the use of some other anesthetic or combination of anesthetics both safer and easier.

"*The Best Methods of Administration.*—(III) No method of administration of chloroform is free from danger, but an examination of the complicated cases appears to show that the occurrence of danger depends largely upon the administrator who employs any particular method. (IV) No conclusion from the evidence before the Committee as to the best method of administration of ether and 'gas and ether' is possible. (V) The data warrant the conclusion that the A. C. E. mixture should not be given from a closed inhaler—for example, Clover's. This conclusion applies to all mixtures containing chloroform.

"*Best Methods of Restoration.*—(VII) The Subcommittee are unable from the material at their disposal to draw any conclusion upon this point.

"*Clinical Evidence Regarding Anesthetics Generally.*—(VIII) Anesthetics are more commonly associated with complications and dangers in males than in females. (IX) Excluding infancy, and taking anesthetics collectively, the complications and dangers of anesthesia increase *pari passu* with advancing age. (X) Anesthetics are notably more dangerous in proportion as the gravity of the patient's state increases. (XI) Danger to life is especially likely to be incurred in early periods of the administration of anesthetics, while the tendency to less grave complications increases directly with the duration of anesthesia. (XII) The tendency for complications, dangerous and otherwise, to occur, increases *pari passu* with the gravity of the operation.

"*Clinical Evidence Regarding Chloroform.*—(XIII) Chloroform is about twice as dangerous in males as in females. (XIV) Chloroform is most dangerous during early infancy and after 30 years of age; least so from 10 to 30 years of age. (XV) In conditions of good health chloroform is very much more dangerous than other anesthetics. In grave conditions chloroform still remains the least safe anesthetic, but the disparity between it and other anesthetics is far less marked than in health. (XVI) When danger occurs under chloroform, whatever its exact nature may be, there is abundant evidence that in a large proportion of cases the symptoms that are observed are those of primary circulatory failure. (XVII) Imperfect anesthesia is the cause of a large number of cases of danger under chloroform. (XVIII) Vomiting during anesthesia, which may lead to danger, seems to be more frequent under chloroform than under other anesthetics. (XIX) Struggling is very much more frequent in the complicated cases under chloroform than in the uncomplicated, and this phenomenon must therefore be regarded as a source of grave danger under chloroform. (XX) The tendency for circulatory complications to appear increases directly with the relative amount of chloroform in the anesthetic employed. (XXI) While vomiting is more common after administration of ether, severe and prolonged vomiting is more common when chloroform has been

used. (XXII) Circulatory depression following anesthetics is more common after chloroform than after ether. (XXIII) While the respiratory complications of anesthesia as a whole are of equal frequency under the ether and chloroform groups respectively, yet those that occur under ether are mostly of a trifling and transitory nature, while those that occur under chloroform are more grave and persistent.

"*Clinical Evidence Regarding Ether.*—(XXIV) Under ether the complications of anesthesia are more frequent with males than with females, but with the former they are generally slight, ether being rather more dangerous with females than with males. (XXV) Ether, where employed throughout or preceded by nitrous oxid gas or by the A. C. E. mixture, is singularly free from danger in healthy patients. (XXVI) Minor troubles in administration due to laryngeal irritation and increased secretion are more common under ether and 'gas and ether' than under chloroform and its mixtures. (XXVII) Struggling occurs more frequently with ether when given alone than with other anesthetics, but it rarely leads to danger. (XXVIII) After-vomiting is more common with ether than with other anesthetics, but it is usually transient. (XXIX) Bronchitis is much more common as an after-effect of ether than of chloroform. (XXX) With 'gas and ether,' as with ether, dangers are more common in females, although complications are more frequent in males.

"*Clinical Evidence Regarding Mixtures and Successions of Anesthetics.*—(XXXI) The A. C. E. mixture in most of the statistical tables holds an intermediate position between chloroform and ether. (XXXII) The A. C. E. mixture is more dangerous in males than in females, but not to such a marked degree as is chloroform. (XXXIII) The administration of ether antecedent to chloroform does not abolish the possibility of chloroform dangers. (XXXIV) The various mixtures and successions of anesthetics were recorded too infrequently to justify definite conclusions.

"*General Conclusion.*—(XXXV) From the evidence before the Subcommittee they are convinced that by far the most important factor in the safe administration of anesthetics is the experience which has been acquired by the administrator.

"In many cases the anesthetization completely transcends the operation in gravity and importance, and to insure success, particularly in these cases, it is absolutely essential that an anesthetist of large experience should conduct the administration."

[The above report has been subjected to some criticism in this country and in Great Britain on the ground that it tells nothing that was not previously generally known to surgeons. Nevertheless, such a report is valuable, as it authoritatively emphasizes certain vitally important truths. Augustus D. Waller[1] severely criticizes both the committee's method of investigation and its conclusions, as does also Dr. Silk, President of the Society of Anesthetists. Eastes [1] and Buxton [2] both defend the methods and conclusions of the committee.]

[1] Brit. Med. Jour., Feb. 23, 1901. [2] Brit. Med. Jour., Mar. 23, 1901.

Martin W. Ware [1] discusses **the field for ethyl chlorid narcosis.** He has employed ethyl chlorid as a general anesthetic in 200 cases of minor surgery. In discussing the history of this method it is shown that it is by no means new, but that either ethyl chlorid itself or similar agents were employed as early as 1852. The proper name of the agent is ethyl monochlorid (C_2H_5Cl). Soullier, of Lyons, was the first to use ethyl chlorid in a large number of cases. It is, however, to Lotheisen, Ludwig, and Wieser that the real credit is due for setting forth the claims of ethyl chlorid as a general anesthetic. There has been but 1 death reported from its use in 11,207 cases. The author employs a modified mouthpiece of the nitrous oxid apparatus for administering the drug. The orifice of the gas supply tube is occluded, and the sliding tube being removed, the ethyl chlorid is sprayed through the air vent on to the gauze fixed in the mouthpiece. Ware has found that spraying the ethyl chlorid with short intermissions is of advantage, for such a plan prevents the frosted breath from accumulating on the gauze. An ordinary funnel with an additional opening on its side may be employed for administering the drug if it be bent to fit the face. The inhalation of atomized ethyl chlorid is not disagreeable and there is no choking or other unpleasant effect. Ten cc. of the drug is used and is sufficient to produce anesthesia after an interval of 1 or 2 minutes. Flushing of the face is quite constant and is followed by free perspiration. The narcotic stage is considered to have been reached when the pupils become smaller, when muscular contractions subside, and when the breathing becomes slightly stertorous. These changes come on rather abruptly. The author has employed this form of anesthesia for 50 minutes in an operation upon a child aged 15 months. The restoration to consciousness is instantaneous and is followed by no disagreeable after-effects. In only 1 instance has Ware noticed alarming symptoms. These symptoms arose in a child whose respiration was interfered with by adenoids, but in this case the symptoms subsided and the administration was continued. In alcoholics marked excitation was frequently encountered and this condition was sometimes present in those of neurotic tendency. No evil effects upon the kidneys or lungs have been recorded. Benjamin W. Richardson has asserted that an anesthetic is dangerous in proportion to the chlorin it contains, and herein may lie any danger which this agent possesses.

Lotheisen [2] discusses the **risks of ethyl chlorid narcosis.** Opisthotonos has been observed in 3 cases; in each the patient was addicted to the use of alcohol. This fact the author does not think contributed to the condition, but believes that it was due to the inhalation of very concentrated vapor. In heavy drinkers Lotheisen prefers to give morphia or heroin subcutaneously before administering the anesthetic. It was discovered accidentally that ethyl chlorid narcosis can be continued indefinitely with either chloroform or ether without evil effect. In the case referred to the ethyl chlorid became exhausted and the operator was obliged to resort to ether in order to complete the operation. Asphyxia

[1] Med. Rec., Apr. 6, 1901. [2] Münch. med. Woch., No. 18, 1900.

has been reported by Respinger, Ruegg, and Seitz. It is thought, however, that the condition resulted from too great a concentration of the vapor. Lotheisen reports a death from ethyl chlorid. The patient was a man aged 41 years, upon whom the surgeon was performing skin-grafting. When the narcosis had lasted 3 minutes the patient became cyanosed and the muscles of the limbs and jaw became spasmodically tense. Breathing was irregular and suddenly stopped. Artificial respiration was kept up for more than an hour together with cutaneous stimulation. The patient, however, did not rally. Death in this case came about very suddenly. The autopsy showed fatty degeneration of the heart-muscles together with marked sclerosis of the coronary arteries. There were no ecchymoses on the pleura or pericardium. The lungs were edematous. The patient was a strong man and a hard drinker. It is thought that the sclerosis of the coronary arteries and not dilation of the heart was the cause of death. The author believes that this patient would also have died if chloroform had been used, as was at first intended. A case is reported in which Lotheisen operated for a large cecal hernia. Heroin was administered subcutaneously a quarter of an hour before the operation. The incision was made, the sac opened, and the omentum removed under infiltration-anesthesia with Schleich's fluid. The detachment of the hernial sac was very painful, and to control this ethyl chlorid was inhaled. After a long operation with ethyl chlorid vomiting has been observed, but it is not so marked as when chloroform or ether is used. It is urged that small quantities only of ethyl chlorid should be employed, and that the vapor must not be concentrated. Breuer's mask with an inspiratory and expiratory valve is used. If the patient should become restless or begin to strain, more of the narcotic should not be sprayed upon the gauze until the anesthetizer has first assured himself by smelling at the expiratory valve that there is no longer any ethyl chlorid being exhaled. If the patient becomes markedly excited or cyanotic the mask should be removed. The author condemns strongly the use of large quantities of the drug, and asserts that experience will enable the anesthetist to obtain and keep up narcosis with smaller quantities than would at first seem possible. Only when used with the utmost care does he consider the drug without danger.

Lennander [1] asserts as his belief that the **sensitiveness of the peritoneum** is largely confined to the parietal portion. In proof of this statement he says that in an extended series of herniotomies and laparotomies done under local anesthesia he was able to show that the intestine, kidney, gall-bladder, and other abdominal viscera could be handled, incised, or otherwise subjected to trauma without actual pain. Any manipulation of the parietal peritoneum was accompanied by great pain. It is thought that the pain of intraabdominal inflammations is due to involvement of the parietal peritoneum—a fact which he claims is borne out by clinical experience. In the light of these observations it is recommended that the administration of a general anesthetic be

[1] Centralbl. f. Chir., Feb. 3, 1901.

avoided in many abdominal operations except when the parietal peritoneum is being handled.

Mikulicz [1] discussed before the Thirtieth Congress of the German Surgical Association the **various methods of anesthesia and their indications.** In considering local anesthesia he asserts that this method is not used as much as it should be and that general anesthesia is too commonly employed. He has employed spinal anesthesia in 40 cases with satisfactory results, but in some of these there were experienced some very disagreeable after-effects. Although commending local anesthesia in certain cases, it is also stated that deaths from this method are not uncommon. Diagrams were exhibited showing the comparative mortality of various operations in which local and general anesthesia were employed. Patients suffering from heart and lung affections should be operated upon by local anesthesia. Lung complications, however, are shown to have followed the use of Schleich's solution. In order to illustrate the mental attitude of certain patients to operation, the author mentions a case of a butcher who was very anxious to see his own stomach and watched with great interest an operation upon this organ by means of a mirror. Mikulicz has of late employed ether much more extensively in his work than he did formerly.

Jaboulay [2] has employed cocainization of the nerve-trunks in a scapulohumeral disarticulation in a case in which a general anesthetic was considered dangerous because of septicemia. Local anesthesia was employed until the nerve plexus was exposed, then a few drops of a 2.5% solution of cocain were injected into the branches of the brachial plexus. The patient experienced no pain during the operation, excepting when the inner portion of the flap was made, which, being supplied by the intercostal nerves, was not without sensation.

Maurice H. Richardson [3] makes some **remarks on anesthesia—general, local, and spinal.** He asserts that in his opinion the dangers of etherization when properly carried out are trivial, and that the subcutaneous use of cocain, especially in extensive dissections, will be found more hazardous than the use of ether. When accidents do occur during etherization they usually result from a disregard of the danger signals and from overetherization, not from the intrinsic effect of the drug. The author thinks that the field for local and spinal anesthesia is largely restricted to abdominal diseases and conditions which endanger life from regurgitations of the stomach and intestinal contents during profound anesthesia. This danger is present during general anesthesia when the patient is unable to swallow or to clear the throat. The evil effect of regurgitation is remote as well as immediate, since many cases of postoperative pneumonia are due to infection brought about in this way. In many emergency operations done for gunshot wounds, stab wounds, railway accidents, and the like, when the patient's stomach is full of food, and in cases of intestinal obstruction, it is thought that local anesthesia, when possible, is justifiable. Richardson's experience

[1] Am. Med., May 4, 1901. [2] Semaine Méd., Nov. 14, 1900.
[3] Boston M. and S. Jour., Apr. 25, 1901.

in the etherization of patients suffering from heart lesions has been very satisfactory. He refers to the case of a patient operated upon for strangulated hernia in the presence of an acute puerperal endocarditis, in which the pulse was 210. His greatest anxiety has been excited in cases in which there are lung complications. It is thought that failure to breathe on the part of the patient during etherization is due to the fact that he has been forced to take deep and long inspirations. This results in an overoxygenated condition of the blood and enables him to continue for a long time without breathing. This truth is illustrated by the fact that a diver after taking quickly from 40 to 60 inspirations can remain under water for some time. During the etherization of a patient suffering from a general peritonitis accompanied by thin black vomitus, if the patient's mouth and nose should become filled with the vomited material and his respiration become wheezy and his color and pulse bad, he should be allowed to recover from the ether sufficiently to swallow and to clear his throat no matter at what stage of the operation this may occur. Local anesthesia should be employed in all trivial operations in regions where it can be thoroughly controlled, but in major operations the author thinks ether preferable. One class of patients in whom the newer methods of anesthesia may be employed is that in which the patient is known to behave badly under a general anesthetic. In operations about the neck, where pressure or injury of the trachea or of the recurrent laryngeal nerves may occur, local anesthesia is indicated. "I cannot believe that either spinal or local cocainization, after 50 years of use as extensive and varied as that of ether, or even of chloroform, has been, will show a safety to be compared with them."

Bainbridge [1] reports the use of **spinal analgesia in children.** This method in children has heretofore not been employed or commended. [Some authors,[2] in fact, advised against the use of the method.] Bainbridge has used spinal analgesia in 6 cases under 8 years of age with satisfaction. The author prepares his cocain solution by pouring over 5 grains of powdered cocain a dram of ether. The glass and rod used in mixing have been previously boiled. One ounce of boiled filtered water is added to the solution, which is made fresh for each case.

In his address to the Paris Academie de Médecine, March 19, 1901, P. Reclus [3] asserts that there are now on record **6 deaths from spinal cocainization** in Europe alone. Even in Tuffier's case, in which a necropsy showed mitral disease of the heart and acute edema of the lungs, the author thinks that cocain may have had a causal relation to the latter condition. The fact that 6 deaths have occurred from the use of spinal cocainization in 2000 cases would certainly seem to indicate that the method is not without danger.

Goilav [4] expresses a very unfavorable opinion regarding the use of **spinal cocainization.** Reference is made to 2 cases, in one of which

[1] Med. Rec., Dec. 15, 1900. [2] Tuffier, Semaine Méd., May 10, 1900.
[3] Jour. Am. Med. Assoc., Apr. 13, 1901.
[4] Bull. et Mém. de la Soc. de Chir. de Bucarest, No. 5, 1900.

death occurred 20 hours after the injection, and another in which the patient was in a desperate condition for 3 days. In both of these cases, however, the patients suffered from arterial sclerosis. On the whole the author is not very favorably impressed with this new method.

Bier, [1] at the Thirtieth Congress of the German Surgical Association, discussed the records of **1200 collected operations** which had been done **under spinal anesthesia.** In order to avoid the symptoms attributable to cocain he has employed other agents, such as tropacocain, eucain, weak solutions of carbolic acid, and other drugs, but not one of these has been very satisfactory. The author prefers using Schleich's solution. Normal salt solution injected into the spinal canal of cats produces anesthesia, but this effect is not produced when the solution is used in man. Tropacocain produces a partial anesthesia, but not sufficient to admit of operations. Bier urges that in order to avoid any change in the cerebrospinal pressure the same amount of cerebrospinal fluid should be withdrawn as is injected for the purpose of producing anesthesia. This method of anesthesia is not thought applicable to general use, and is considered to be still in process of development.

J. Leonard Corning [2] contributes **some conservative jottings apropos of spinal anesthesia.** The author discusses the history of the method and its technic. One point which he makes in regard to the latter is that if the subarachnoid space is not reached when the needle is thrust into the tissues for a sufficient depth, then it is better to withdraw the needle and make an entirely new puncture than to attempt to enter the canal at another point without withdrawing the needle. It is not thought that the days of chloroform and ether anesthesia are numbered, nevertheless it is believed that the subarachnoid injection of cocain will find its place among the established methods of producing anesthesia. The greatest stress is laid upon the necessity of carefully carrying out the technic of the operation. The author foresees trouble and disaster as the result of the use of this method in the hands of irresponsible persons.

The question of **spinal anesthesia** was discussed at a meeting of the Medical Association of the Greater City of New York, [3] December 10, 1900. Fowler, of Brooklyn, followed Corning, who had spoken on the neurophysiologic aspect of the method, and gave his experience after the use of spinal anesthesia in 81 cases. He was not prepared to admit that the vertigo, pallor, vomiting, etc., which accompanied the subarachnoid injection of cocain were due to the drug itself, since these symptoms were present regardless of the amount of cocain which was injected, and not infrequently occurred as soon as the puncture was made and before any injection was made. It has seemed to Fowler that there is some relation between the nausea and vomiting and the force of the circulation. With this idea in mind he has recently employed a preliminary injection of 0.1 grain of strychnia with some success. Involuntary defecation occurred in 5 cases, and in 4 the

[1] Am. Med., May 4, 1901. [2] Med. Rec., Oct. 20, 1900.
[3] Med. Rec., Dec. 22, 1900.

patients were conscious of the act. The author had experimented with antipyrin and chloreton, but these remedies did not produce anesthesia. Notwithstanding his successful experience with the method, Fowler thinks that the ideal anesthetic must remain one which will render the patient entirely unconscious of his environment.

Marx, in continuing the discussion, gave his experience in the use of **spinal anesthesia in obstetric and gynecologic practice.** He has used the method in 125 cases, in 2 of which it was an absolute failure. The effect upon labor was absolutely nil, the contractions continuing without the patient's consciousness. He thinks the method indicated in a prolonged first stage, but in gynecologic work he does not believe that it will ever take the place of general anesthesia. The method should not be employed upon those in whom it is known that cocain is without effect, nor in those of a highly neurotic tendency.

Corning [1] describes his attempts to produce **spinal anesthesia by cataphoresis.** In this operation the author employs 2 tubes, one sufficiently large to contain the other. The reader should consult the author's own words in order to understand the method. Corning had an opportunity to try this upon one occasion; but after waiting for half an hour without any anesthetic result it was thought advisable to give the patient ether. The anesthetization with ether had hardly been begun when it was observed that the patient's extremities were without sensation, and the operation—an osteotomy of the foot—was completed without the further use of ether.

Schwarz [2] submits a report of 16 operations in which he used **tropacocain for subarachnoid injection.** The author asserts that anesthesia was complete from the use of from 0.5 to 0.8 grain of the drug, and that none of the disagreeable after-effects which are observed after cocain is used was present.

Stone [3] reports a **death from Schleich's mixture.** The death is attributed to paralysis of the cardiac center followed by paralysis of the respiratory center. He has employed the Schleich mixture in 441 instances, with serious symptoms in only 13, and with but one death.

John B. Murphy,[4] in discussing **analgesia from spinal subarachnoidean cocainization,** briefly reviews the history of spinal analgesia as first proposed by Corning and first practised by Bier in surgical operations. Of 631 cases collected by Murphy of subarachnoidean cocainization there was perfect analgesia in 95%, partial in 2.21%, and in 3.32% it was a failure. But 1 death has been reported in Tuffier's clinic, and in this case it is doubtful whether the death was directly due to the method, since marked cardiac lesions were found postmortem. The effect is produced by direct application of cocain to the posterior roots and ganglia and not to the cord itself. The sense of contact is not affected, the reflexes are slightly diminished, some incoordination is usually present, intestinal peristalsis and uterine contractions are generally stimulated, while the sphincteric action of the vagina, rectum, and

[1] N. Y. Med. Jour., May 4, 1901.
[2] Centralbl. f. Chir., Mar. 2, 1901.
[3] Med. Rec., Aug. 11, 1900.
[4] Jour. Am. Med. Assoc., Feb. 9, 1901.

bladder is frequently completely abolished. Dosage and the sterilization of the solution used are next discussed. The glass ampullas containing the solution, which have been prepared by certain well-known and trustworthy manufacturers, have been used by Murphy with much satisfaction. The point of introduction is the space between the fourth and fifth lumbar vertebras, half an inch from the median line, the patient occupying a sitting position. It has been impossible to insert the needle at this point in some cases. Injections have been made between the sixth and seventh cerebral vertebras, but Murphy cannot think this operation free from danger until further investigation satisfies him that such is the case. The fluid should always be injected slowly, requiring from 40 to 60 seconds, and the injection should never be made except when the cerebrospinal fluid is flowing from the needle. The symptoms are as follows: First there is a sensation of heat passing over the entire body, then that of thirst, followed in a few minutes by nausea, which may last for 10 minutes. There is increased rapidity of pulse, pallor, and perspiration followed by vomiting. These symptoms last for a few minutes usually, but in some cases they are very marked and make stimulation necessary. Hyoscin hydrobromate, $\frac{1}{200}$ grain, and nitroglycerin, $\frac{1}{100}$ grain, are, in Murphy's opinion, the best stimulants to be used under the circumstances. The **analgesia,** which usually begins in the feet and gradually ascends, although in rare instances it may first appear as a band around the body and then descend, usually appears in from 3 to 10 minutes, while in some instances it may be delayed from 20 to 30. In rarer instances still the analgesia has been known to ascend from the level of the injection and involve the upper extremities, the neck, and the face. The duration of the analgesia may extend from 12 minutes to 5 hours. Operations on the abdomen and amputation of the breast have both been performed by this method, although muscular rigidity sometimes interferes with abdominal work. This method may be employed at all ages. Headache, which may last from several hours to several days, is a usual postoperative symptom; prolonged vomiting is unusual; vertigo and some ataxia in gait may persist for some days. The temperature usually rises after the operation. On the day after the operation the patient is in a much better condition than when chloroform or ether has been used. Coma and delirium have both been observed in some cases. Mental exaltation from cocain is frequently observed. Murphy thinks that failure to obtain analgesia after the employment of this method is due to either faulty technic or personal idiosyncrasy.

Maurice H. Richardson [1] describes his **visit to Tuffier's clinic** in Paris during the summer of 1900. Although Richardson thinks that spinal analgesia has its indications in surgery, at the same time he believes that its exact domain has not yet been definitely outlined nor are all of its dangers thoroughly understood. He was greatly impressed by the entire absence of pain in Tuffier's cases, and from that point of view thinks the method eminently satisfactory; but the patients gave

[1] Boston M. and S. Jour., Jan. 10, 1901.

the appearance of being in actual danger and the facial expression showed great anxiety. There was at no time any outcry or struggling or even restlessness on the part of the patients.

W. L. Rodman [1] reports 2 cases in which he has used **spinal analgesia** for operations upon the lower extremities. The method proved very satisfactory in both instances, and there was the absence in the second case of the anxiety and fear which have been spoken of in other operations by this method, and Rodman attributes it to the fact that during the entire operation his patient was kept blindfolded. The nausea in this case was also much less than in the first case. "No one, I take it, can look at his own blood without misgivings and apprehensions."

Dudley Tait and Guido Caglieri discuss **the subarachnoid space from an experimental and clinical standpoint.** [2] These writers give to J. Leonard Corning the credit of having first suggested and carried out, both in animals and in man, spinal analgesia by means of cocain injected into the lower dorsal region. Ziemssen (1893) first suggested introduction of remedial agents by lumbar puncture, Sicard being, however, the first to carry out this plan. The first use of tetanus antitoxin and saline solution in the subarachnoid space is also attributed to Sicard. In describing the technic of lumbar puncture these authors give the distance to be traversed by the needle, even in obese patients, as from 6.5 to 7 cm. The smaller the caliber of the needle, the slower and consequently the safer will be the procedure. The rapid introduction of 2 cc. of fluid in one of their patients produced considerable shock. The fluid should never be injected unless there is evidence that the needle is in the subarachnoid space, as can be told by the flow of cerebrospinal fluid. After much experimental work and a careful study of the subject Tait and Caglieri reach the following conclusions: "(1) To the already known practical routes leading to the subarachnoid space we propose to add the 'low cervical,'—in the sixth cervical space,—which we find both easy and safe. (2) The cerebrospinal fluid possesses none of the properties of lymph. (3) Contrary to the classic opinion, the cerebral perivascular lymphatic sheaths do not empty into the subarachnoid space (Sicard). (4) Liquids injected by lumbar puncture diffuse rapidly toward the different cavities of the brain, and subsequently reach the cortex. (5) The difference in osmotic currents in the cerebrospinal fluid —presence of exosmosis and absence of endosmosis—in addition to the protection afforded by the perivascular lymphatic sheaths, explains the rarity of infection of the cerebrospinal fluid in the course of generalized blood infections and also the gravity of primary infections of the cerebrospinal fluid (Sicard). (6) Direct intramedullary medication is feasible and deserving of further trial. (7) Subarachnoid injections of cocain are devoid of danger if made with certain precautions. The solution should be freshly prepared and injected slowly at a temperature of 37° C. and never in a greater quantity than 3 cc. (8) The extent and duration of the analgesia thus induced are generally in direct proportion to the amount of drug injected. Analgesia is noted in some cases as

[1] Phila. Med. Jour., Nov. 3, 1900. [2] Jour. Am. Med. Assoc., July 7, 1900.

early as 5 minutes after the injection, and in others, for unknown reasons, as late as 35 minutes. Its duration is sufficient for the performance of all operations on the lower limbs and pelvis, and may be sufficient to be of service in obstetrics. (9) The disagreeable effects—headache and vomiting—sometimes noted after these injections are partly due to the sudden increase of pressure in the subarachnoid space—too rapid diffusion toward the brain—and principally to the amount of cocain used. These postoperative symptoms are never alarming or lasting. They recall the effects of intradermic injections of cocain, and never resemble in severity the symptoms so frequently observed during and after chloroform or ether anesthesia. (10) One cc. of a 1 % solution of cocain injected slowly is generally sufficient for all practical purposes, and is not followed by untoward symptoms. (11) For obvious reasons, it is a good plan to withdraw a small amount of cerebrospinal fluid prior to making an injection. (12) To the careful surgeon who aims to divorce himself gradually from the dangers of general anesthesia, and the limitations of superficial analgesia, spinal analgesia may, under certain exceptional conditions, prove of signal service, and it behooves us to herald abroad the fact that this progressive step was made by a modest American physician—J. Leonard Corning."

Rudolph Matas [1] discusses **local and regional anesthesia with cocain and other analgesic drugs, including the subarachnoid method, as employed in general surgical practice,** in the most thorough and minute manner, urging upon the surgeon the wide field for the application of local and regional anesthesia. He calls attention particularly to the early work done by American surgeons in local anesthesia, mentioning especially the names of Hall, Halsted, and Corning. The author thinks that the most important discovery made regarding cocain anesthesia was that of Corning, in 1885, when he showed that the anesthesia could be indefinitely prolonged if the circulation of the anesthetized area were controlled by elastic constriction. This same fact was discovered independently by Mayo Robson in 1886. German and French writers insist, however, upon giving credit to Kummer, of Geneva, for the application of the constrictor in local anesthesia. The neuroregional, as distinguished from the purely local, anesthesia was first demonstrated by Hall and Halsted in 1884. The direct open injection of nerve-trunks with cocain was first practised for surgical purposes by George W. Crile, of Cleveland, Ohio, who amputated a leg after injecting the sciatic and anterior crural nerves. The author, independently of Crile, amputated an arm after the same manner a few months later. The discovery of eucain B and nirvanin, and their general application and nontoxic properties, together with the fact that they will stand boiling without decomposition, has caused local anesthesia to come much more generally into use. Ceci, of Geneva, since 1897 has insisted upon the systematic use of morphia as a preliminary to local anesthesia, and its utility has become very generally recognized. "Morphia-cocain-chloroform anesthesia" has been found in many instances to

[1] Phila. Med. Jour., Nov. 3, 1900.

be of great value, in rendering unnecessary the administration of a large quantity of chloroform, and hence in reducing largely the danger of this anesthetic. In describing the **local infiltration** method the author calls attention to the fact that the anesthetic agent must be dissolved in normal salt solution, which renders the drug much more effective and has made possible the use of large quantities of very weak solution. The general utility of a very weak solution was first called attention to and urged upon the profession by Schleich, who is spoken of as the "father of the infiltration method." The author thinks that often the Schleich solutions are condemned because they have not been properly employed, and he says that this method of infiltration is indicated in all operations in which the circulation cannot be controlled and in which a large part of the infiltrating solution must be allowed to remain in the tissues. It must not be forgotten, however, that elastic constriction is of the greatest assistance in intensifying and prolonging the anesthesia. The most general mistake made in the employment of the Schleich solutions is the fact that the skin itself is not first thoroughly edematized, and it must also be remembered that all of the tissues involved in the field of operation must be infiltrated with the injected fluid until they have become tense. If these fundamental rules are rigidly adhered to this method of producing local anesthesia will become much more popular and productive of more satisfactory results. The fluid if injected warm (80° to 100° F.) will become diffused much more readily, but the application of ice bags to the edematized area after injection will greatly enhance the anesthesia. Matas' article is illustrated by 2 cuts (Figs. 9, 10), which show the use of an especially devised infiltration apparatus. With his increased experience in the use of the infiltration method he has been able to reduce gradually the strength of the cocain solution, until now he confines himself largely to the use of the weaker Schleich solution. In intraneural injections into large nerves he uses a 1 % solution of cocain. Lately he has used to a great extent eucain because of the easy way in which it may be sterilized, but he has not found it as effective as cocain unless the strength of the solution is increased. The nontoxic properties of the drug, however, make this increase practicable. In making his solutions he uses the tablets prepared by the various manufacturing chemists, dissolving them in hot sterilized salt solution. He has found that the cocain solution can be sterilized after the fractional method by bringing the solution nearly to the boiling-point, this being repeated a number of times. Great advantage has been found from the combination of the paraneural and the infiltration methods, and this combination has greatly enlarged the operative field of local anesthesia. Matas does not agree with those who claim that the infiltration of the tissues destroys anatomic relations or the normal appearance of the tissues. The fact that it makes them bloodless, he claims, renders operating easier. In order to avoid numerous punctures it is his custom to use a very long needle. In the bladder Matas now prefers the use of nirvanin solution, which he finds very satisfactory. He derives great benefit from the use of morphia prior

to operation. In cases of profound sepsis, in perforations of the gastrointestinal canal, in strangulated hernia, and in intestinal obstruc-

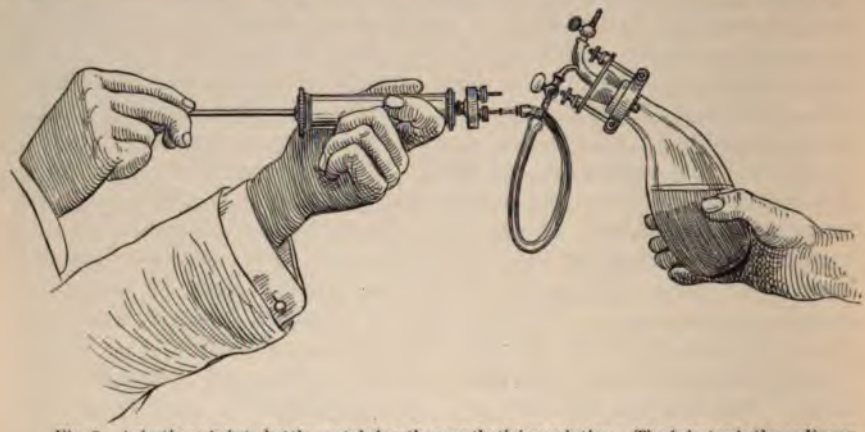


Fig. 9.—Injecting air into bottle containing the anesthetizing solution. The injector is the ordinary pump of the Potain aspirator with the valves reversed for charging instead of aspirating. The bottle is an ordinary graduated nursing bottle (8 oz. capacity), manufactured by J. Elwood Lee Co., for the Lee sterilizer and compress heater. It is provided with the ordinary Potain perforated rubber stopper, which is held firmly in the bottle by a specially devised metallic collar, shield, and thumbscrews, which prevent the stopper from being blown off by the compressed air. The delivery (outlet) and pumping (inlet) rubber tubes are screwed to the nozles attached to the stopper to prevent accidental detachment during operation. The delivery tube is shorter than shown in Fig. 10, to facilitate sterilization (Matas, in Phila. Med. Jour., Nov. 3, 1900).

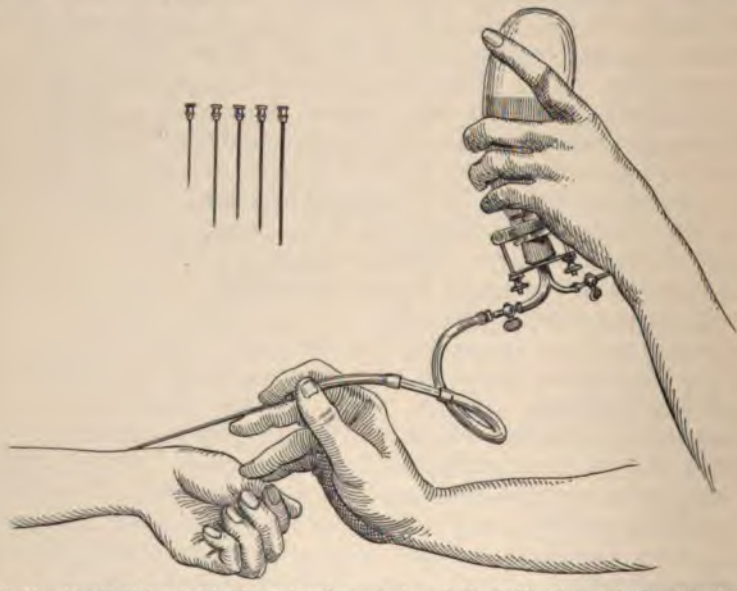


Fig. 10.—Anesthetizing bottle charged and reversed ready for infiltration and edematization; the pumping outfit is detached; the needles shown in the picture are of different lengths and calibers, from 10 cm. (4 inches) to 5.5 cm. (2¼ inches); the caliber varies from Nos. 1-2 (Dieulafoy) to that of a fine hypodermic (Matas, in Phila. Med. Jour., Nov. 3, 1900).

tion, etc., in which prostration is marked, if the incision through the skin is made while the area is under the influence of local anesthesia, it

will then be found that an infinitesimal quantity of chloroform is required to produce an insensibility sufficient for the needs of the case. The use of the various methods of producing regional anesthesia is carefully described and illustrated by cuts, which are here reproduced. Not infrequently the elastic constrictor becomes intolerable to the patient if the operation lasts as long as an hour, and then it is necessary to relax it.

Figs. 11 and 12.—Fig. 11: Showing point of injection in the regional anesthesia (paraneural method) of the fingers alone. The lower points indicate seat of deep injections to reach the digital interosseous and palmar nerves (paraneural method). The linear outline over metacarpal of index indicates area of artificial edematous infiltration (regional paraneural infiltration method) for disarticulation of index and its metacarpal. Fig. 12: Two points at base of thumb indicate seat of deep (paraneural) injection of the digital nerves to control sensibility of thumb. These may be combined with a ring of dermal infiltration at the same level (regional paraneural infiltration method) encircling the digit. The outline over the first metacarpal indicates area of edematization associated with two deep interosseous injections to anesthetize entire thumb and its metacarpal, as in corpometacarpal disarticulations (regional paraneural infiltration method) (Matas, in Phila. Med. Jour., Nov. 3, 1900).

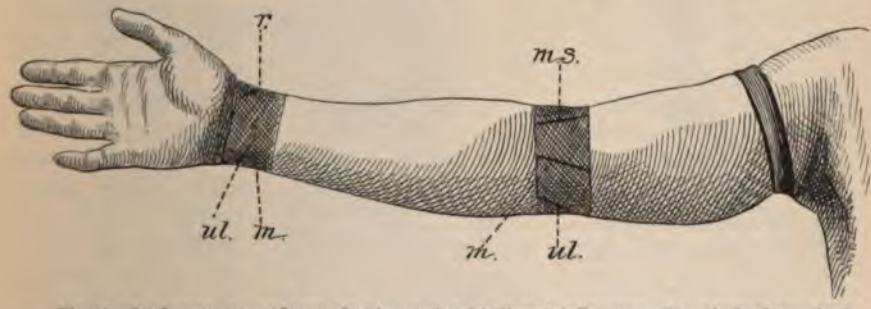


Fig. 13.—Surface anatomy of arm, showing regional infiltration (intraneural method) of anesthesia as practised by the author to obtain insensibility of the entire hand and forearm. A zone of anesthetic dermohypodermic infiltration encircles the arm at the bend of the elbow (shaded zone). The arm is then exsanguinated by elevation and the constrictor is applied at the axillary level. Three incisions are then made to expose the musculospiral (*m.s.*), the ulnar (*ul.*), and the median (*m.*) nerves. Each nerve is then injected separately with the anesthetizing solution. The entire hand and lower third of forearm can be anesthetized by a similar process, except that chief reliance is placed upon the zone of infiltration, which edematizes all the tissues *en masse* down to the interosseous membrane, separate stronger paraneural injections being made along the tracts of the median (*m.*), ulnar (*ul.*), and radial nerves (regional infiltration paraneural method) (Matas, in Phila. Med. Jour., Nov. 3, 1900).

When the circulation has been reestablished the constrictor can be reapplied. The constrictor will be more comfortable to the patient if applied over a soft pad or in a spiral manner. One can obtain an idea of a wide field of regional anesthesia when Matas tells us of a case in which he removed a large portion of both upper maxillas and the entire hard palate. In this case anesthesia was produced by infiltrating the superior maxillary

divisions of the trifacial in both sphenomaxillary fossas. The patient complained of nothing during the operation excepting the use of the chisel and mallet which jarred his head. [This case illustrates better than any we have yet seen reported what can be done with cocain.] Matas considers the neck one of the most favorable positions for the employment of the infiltration method. He has ligated the common carotid five times by this method and the external carotid thirty-six times. The author suggests the possibility of using this form of anesthesia in the performance of laminectomy when the administration of a general anesthetic is made difficult by the position of the patient. Since using the various methods of producing regional anesthesia he asserts that he has been able to reduce the indications for a general anesthetic to at least 50% or 60% of cases requiring operation. The author is careful to assert, how-

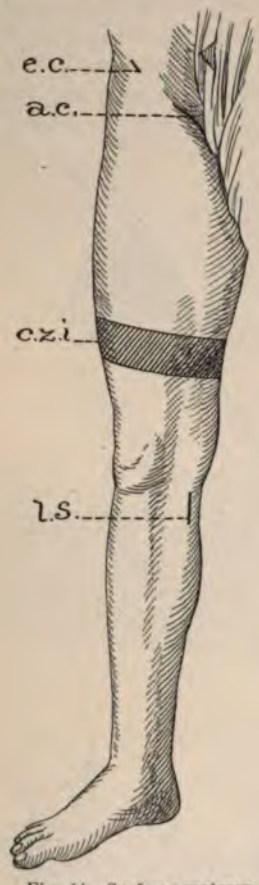


Fig. 14.—Surface anatomy of lower extremity, showing superficial points where the external cutaneous (*e.c.*) and anterior crural (*a.c.*) nerves can be exposed as they emerge under Poupart's ligament. The infiltration of these nerves will give complete control of the sensibility of the thigh, except the upper and inner half. The circular zone of infiltration (*c.z.i.*), if carried deeply so as to edematize the entire circumference of the limb (in wasted, emaciated subjects), will suffice without special neural injection (except into the sciatic) to completely control the sensibility at and below (peripherad of) the infiltrated zone. The zone of dermohypodermal infiltration is far more important posteriorly to control the sensitive fibers of the lesser sciatic, and is necessary, in connection with infiltration of the greater sciatic, in all operations involving the lower half of thigh and knee. In this last class of cases the circular infiltration need not be pushed deeper than the aponeurosis (Matas, in Phila. Med. Jour., Nov. 3, 1900).

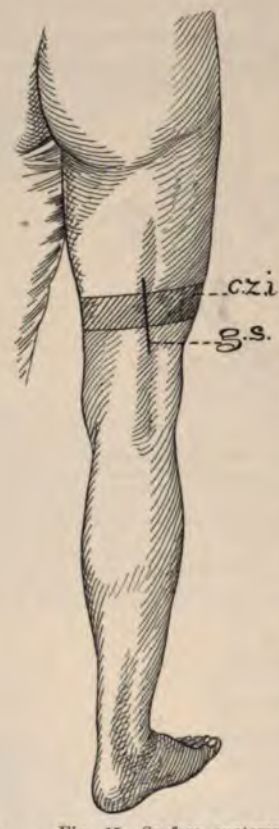


Fig. 15.—Surface anatomy of the lower extremity, showing incision to expose the greater sciatic nerve (*g.s.*) and zone of dermohypodermal infiltration encircling the thigh. In extensive operations requiring anesthesia of the foot or leg (amputations, excisions, etc.), the intraneural injection of the sciatic and paraneural infiltration of the long saphenous below the knee will suffice to control completely the sensibility of the limb. In operations involving the knee or the thigh the zone of dermohypodermal injection (*c.z.i.*), together with the injection of the external cutaneous and anterior crural, becomes necessary (Matas, in Phila. Med. Jour., Nov. 3, 1900).

ever, that local anesthesia has its limitation, and that he never hesitates to resort to a general anesthetic when conditions are such as to indicate or justify its administration. He thinks, however, that general surgeons do not appreciate the wide field for the use of cocain and like remedies for the production of regional anesthesia. Matas' paper closes with a discussion of the subarachnoid method of producing analgesia. He does not think that the method of making the puncture in the cervical region is as safe as one might judge from the experience of Tait and Caglieri, of San Francisco. The largest space in the lumbar region is that between the last lumbar vertebra and the sacrum, but the space between the fourth and fifth lumbar vertebras is much more easily identified by surface landmarks and hence is more accessible. He has employed this method in 9 cases. His experience does not accord with that of Tait and Caglieri in the lower animals, nor with that of Keen in man, so far as the use of eucain is concerned in producing analgesia by subarachnoid injection. He has used, however,

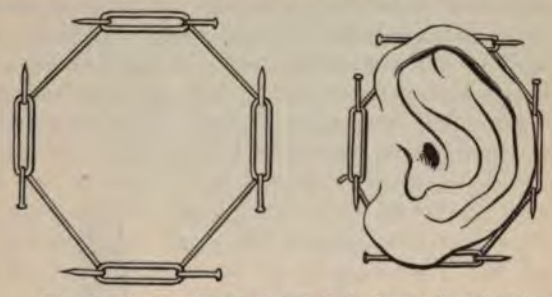


Fig. 16.—Diagrams illustrating method of controlling the circulation and of prolonging the effect of cocain anesthesia in extensive operations on the auricle. The anesthetic solution is infiltrated around the pedicle of the ear by circumferential infiltration. The pins are used by bridging posts to prevent the elastic from slipping when excision or amputation is required, as in vascular neoplasms (Matas, in Phila. Med. Jour., Nov. 3, 1900).

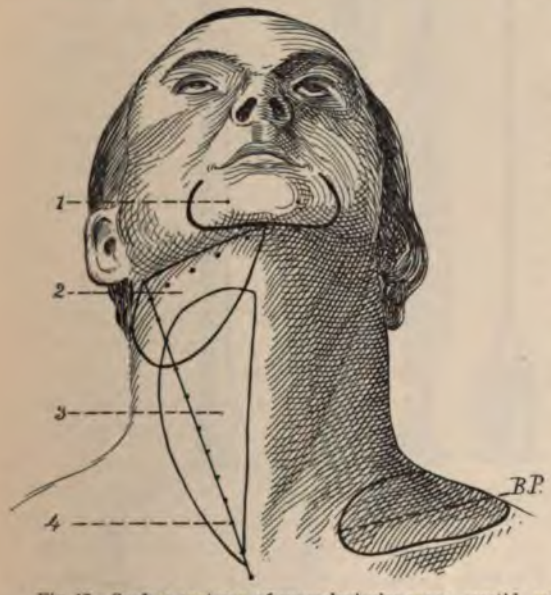


Fig. 17.—Surface anatomy of supraclavicular space, carotid, and submaxillary regions, to show (*B.P.*), Crile's method of "blocking" the brachial plexus outside of the scalenus. The oval outline indicates area of edematization in the supraclavicular fossa bisected by the line of incision. *1* indicates mental foramina, for deep paraneural injection, surrounded by area of artificial anesthetic edema (applied in extirpation of the lower lip for carcinoma). *2* points to submaxillary triangle, which is entirely filled with the anesthetizing fluid. The dotted lines indicate line of intradermal injection for incision in extirpating infected glands. At this point deep infiltrating injections are also made to reach the floor of the mouth, root of tongue, the lingual and inferior dental nerves, which are quite accessible with long needles at this point. *3*, outline of area of anesthetic edematization for the ligation of the common carotid, external carotid and its branches, the removal of infected glands, etc. *4*, dotted line indicates line followed in making a preliminary intradermal infiltration before proceeding to the general edematization of the carotid area (Matas, in Phila. Med. Jour., Nov. 3, 1900).

with entire satisfaction, the Schleich tablets in the following way: "Five tablets, each containing $\frac{1}{5}$ grain of cocain hydrochlorate, $\frac{1}{40}$ grain morphin hydrochlorate, $\frac{1}{5}$ grain sodium chlorid, were dropped into 100 minims of hot distilled water and dissolved. The solution was again sterilized by the fractional method. Twenty minims of this solution represents $\frac{1}{5}$ of a grain of cocain, $\frac{1}{40}$ of a grain of morphin, and $\frac{1}{5}$ of a grain of sodium chlorid. The syringe, which contains 30 minims, was

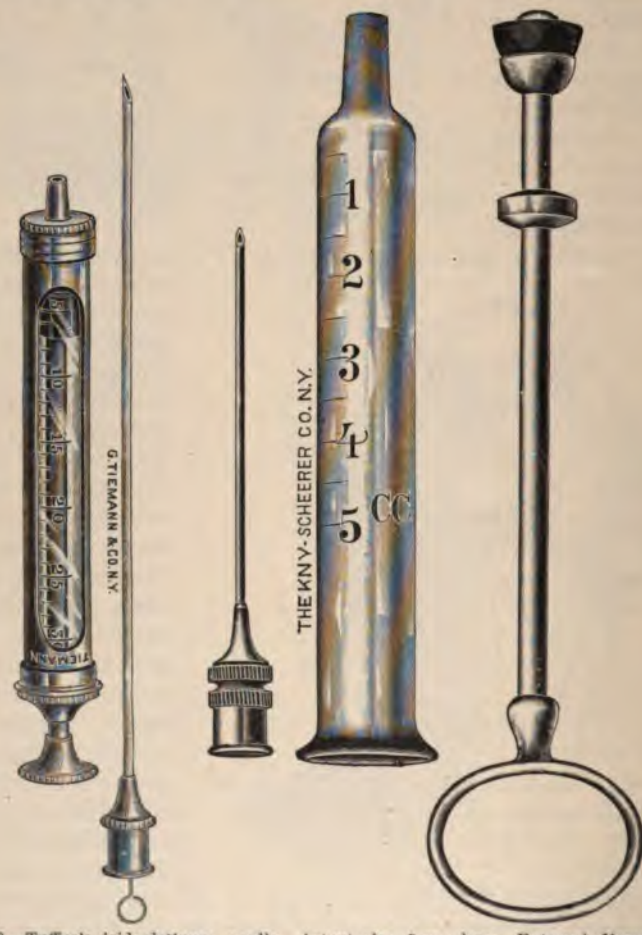


Fig. 18.—Tuffier's iridoplatinum needle. Actual size, 9 cm. long. External diameter 1.1 mm.; internal 0 8 mm. The sharp but short point is important (Matas, in Phila. Med. Jour., Nov. 3, 1900).

filled with the solution and 22 minims were injected; the excess of 2 minims is allowed for waste. The solution should always be used warm, about 90° to 100° F. The effects following the injection of this mixed cocain-morphin-saline solution were so satisfactory that in future I shall continue to use this combination. The tablets used were those sold for the ready preparation of Schleich solution No. 1 by several

well-known and reliable manufacturers." He has found difficulty on a number of occasions in entering the spinal column, and more than once has been compelled to repeat the punctures four or five times. He recommends directing the point of the needle strictly toward the median line in the center of the interspinus space, keeping closer to the upper spine than to the lower. Symptoms referable to injury of the cauda equina have been reported by Sicard and Cadol, and Heumberg has reported a case in which an intradural and medullary hemorrhage followed an injury to the veins accompanying the filum terminale. In this case, however, the puncture was made for disease, and numerous tubercular meningeal adhesions were found at the autopsy. Matas thinks that injury to the cauda equina is almost impossible owing to its mobility. He suggests, however, that the needle used should not be too pointed. In the cases reported in which there has been trouble from the use of this method of producing analgesia, it has been pointed out by Tuffier that more than 1 or 2 cg. had been used. The opinions of the Roumanian surgeons Racoviceanu-Pitesci and Severeanu regarding the method are extremely conservative and far from sanguine regarding its universal application. The experience of these surgeons with the method has been very extensive. In 125 cases which Tuffier himself has operated upon 5 deaths occurred, 4 of which could not be referred to the anesthesia, however, and the fifth case, which died with the symptoms of asphyxia, showed at the autopsy mitral insufficiency and two fresh lung emboli. It would seem from reported cases that occasionally it is impossible to produce analgesia by this method, although Tuffier, Cadol, and others claim that the failure was due to a poor preparation of the alkaloid or to defective technic. All of the author's 9 cases were exempt from toxic or serious symptoms during the operative or anesthetic period. In 4 patients there was an abnormal loquacity and cheerfulness. In 2 there was vomiting at the end of the anesthesia, and in the majority of cases the pulse was normal throughout the operation. In only 3 was it deemed necessary to stimulate in any way. The chief postoperative symptom was headache, which came on from 5 to 12 hours after the injection, and this in one case persisted for 10 days. Matas closes his article with the following conclusions: "Judging purely from my personal experience, I would limit the indications for its application at the present moment: (1) To adults, and to reasonable persons who have good self-control, thereby

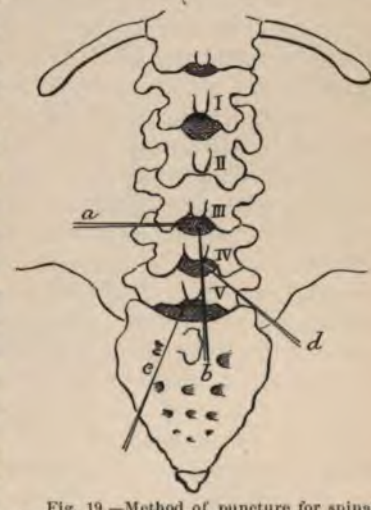


Fig. 19.—Method of puncture for spinal drainage: *a*, Quincke's method; *b*, Marfan's; *c*, Chipault's; *d*, Tuffier's.—Modified from Chipault (Matas, in Phila. Med. Jour., Nov. 3, 1900).

excluding children, hysterical patients, and the insane. (2) To patients in whom the methods of local or regional anesthesia are inapplicable. (3) To patients suffering from emphysema, advanced asthma, chronic bronchitis, and other respiratory affections in whom a general inhalation anesthetic is absolutely contraindicated; in advanced cardiac cases with degenerative lesions, I would fear the possible depressing effects of the injection and excitement on the circulation. (4) In the majority of cases in which the painful part of the operation is not likely to be prolonged beyond 1½ hours, as I would be averse, in the present state of

Fig. 20.—The spinal subarachnoid method of cocainization. The patient is seated on the edge of the operating table. The exact position of the iliac crests having been previously determined, the spinous process corresponding to a transverse line drawn across the spine, on a level with the highest points of the crests of the ilia, is held by the left index. The right hand of the operator holds the needle which is directed forward and toward the middle line from a point 1 cm. (⅜ inch) to the right of the spine.—Tuffier, Semaine Méd., May 16, 1900 (Matas, in Phila. Med. Jour., Nov. 3, 1900).

our knowledge, to repeat a second cocainization or to increase the total dose of the cocain to more than 2 centigrams, especially in exhausted subjects."

Blood-pressure in its Relation to Anesthesia Produced by Chloroform or Ether.—Professor Simon Duplay and Dr. Louis Hallion [1] have published a long article on the changes produced in the blood-pressure during anesthesia from inhalation of chloroform or ether. The object of the investigations which they made on dogs anesthetized with these substances was to study the respiration and pulse considered

[1] Arch. Générales de Méd., Aug., 1900; Lancet.

in relation to the blood-pressure, the carotid or femoral artery being for this purpose connected with a François-Franck registering manometer and a sphygmoscope, while the respirations were counted by means of a Marey pneumograph. As is well known, the blood-pressure occasionally rises at the commencement of chloroform inhalation and in all cases falls when anesthesia supervenes. The important, constant, and lasting phenomenon of chloroform inhalation is the fall of the blood-pressure, and the great danger in this form of anesthesia is the reduction of the blood-pressure below certain limits. Under ether, on the other hand, even when this anesthetic is given continuously and in relatively large doses, the blood-pressure remains for a long time at about normal or even above normal. In fatal cases of chloroform toxemia, in certain cases, probably in most, the respiration ceases before the heart's action stops. Many have thought that the stoppage of the respiration was the cause of the stoppage of the heart, so that death under chloroform was really due to asphyxia. Under ether, however, primary heart failure is very rare. Even respiratory failure only occurs, if we omit cases in which mechanical causes for it are present, when the anesthesia is so profound that the medullary centers are deeply narcotized. In these cases the blood-pressure falls and the mechanism of respiration passes into abeyance owing to the cessation of nerve stimuli from the poisoned centers. In practice these perils practically never occur unless as a result of preexisting disease or of the oversight of the most obvious signs of danger. Professor Duplay and Dr. Hallion maintain, on the contrary, that in the case of chloroform deaths are never due to failure of the respiration, relying on several arguments, one of which is as follows: When syncope is fully established let artificial respiration be substituted for the natural respiration (currently supposed to be insufficient when the animal is profoundly under the influence of the anesthetic) and at the same time let the administration of the anesthetic be continued. If the failure of the circulation which caused the syncope were really due to the anesthetic interfering with the respiration, the syncope ought to be recovered from under artificial respiration; but this, according to Professor Duplay and Dr. Hallion, never happens, for the circulation does not improve and finally stops altogether. M. C. Richet has pointed out that when alarming symptoms are induced by the anesthetic administered for a surgical operation, artificial respiration and rhythmic traction of the tongue are resorted to, the air thereby thrown into the lungs is more than sufficient to prevent death from asphyxia. The real cause of death in such cases is that the cardiovascular apparatus has been paralyzed by the anesthetic at the same time as are the respiratory centers. Stoppage of the respiration, although not serious in itself, is nevertheless an extremely important symptom, for it indicates the near approach of irremediable interference with the circulation. The patient almost always survives if the anesthetic is stopped and artificial respiration practised as soon as the natural respiration has ceased, but if at this stage the cardiovascular apparatus happens to be so affected that the blood-pressure has fallen nearly to zero, the case is hopeless. Pro-

fessor Duplay and Dr. Hallion hope that they will be able before long to describe a method of ascertaining the blood-pressure during surgical operations under anesthetics.

Local Anesthesia and Narcosis.—Dr. Carl Ludwig Schleich [1] recently published an article embodying the results of his more recent experiences in local infiltration anesthesia. He proclaims that it is coming more and more into general use and must in many instances supersede general anesthesia when the latter may be attended with danger. Infiltration anesthesia properly conducted is, according to Dr. Schleich, absolutely without danger, owing to the very small amount of the anesthetic used locally, and it is particularly indicated in all tumors and neoplasms of the skin and subcutaneous tissues; *e. g.*, fibroma, nevus, angioma, lipoma, in most plastic and superficial operations such as tenotomies, excisions of scar-tissue and ganglia, transplantations, and the suturing of fresh and recent wounds and injuries, and for dermoids, chancroids, and sarcomas. The *modus operandi* is to fill the entire skin and subcutaneous tissue at and around the site of the intended operation with the infiltration fluid and to infiltrate the tissue no more than is necessary. In nervous patients the needle-pricks of the hypodermic syringe may be made painless by the application of ethyl chlorid. Major amputations may be performed as well as operations on the abdomen (herniotomy and celiotomy). In injecting the fluid for operation on boils, carbuncles, or abscesses it is necessary to begin the infiltration on the surrounding healthy and noninflamed tissue. For operation on the fingers or toes the method practised by Oberst is recommended—that is, a ligature should be tightly applied at the base of the digit, after which injection may be made into the subcutaneous tissue. The pressure of the blood in this case causes edema and aids the infiltration to diffuse readily and evenly throughout the finger in about half a minute. Cocain and its derivatives, tropacocain and nirvanin, are the drugs most employed. Referring to the subject of narcosis or general anesthesia, Schleich recommends that a special solution as follows be used in cases in which general anesthesia is imperative: ethyl chlorid ½ to 2 parts, chloroform 4 parts, sulphuric ether 12 parts; and he states that he has used this mixture in about 5000 cases without any bad symptoms resulting. Local anesthesia has been extensively adopted in amputations, resections, and operations on bones (Rubinstein), in gynecologic operations (Abel), and in ophthalmic operations (Würdemann), as well as for costal resection, urethrotomy, hydrocele, hemorrhoids, fistula, etc. Schleich has in 250 cases used the infiltration method in operating on medical men, and with success. [As in other papers on this subject, there is less said about the dangers of local anesthesia than is perhaps advisable. Even when the obvious dangers of sepsis are omitted, since with due care they can be almost eliminated in hospital work provided their presence is appreciated, there yet remain drawbacks to the use of the infiltration method. The average patient does not go through a severe operation even when rendered analgesic—for analgesia

[1] Berlin. klin. Woch., No. 13, 1900; Lancet, July 28, 1900.

and hardly anesthesia is obtained in Schleich's method—without considerable shock and nerve prostration. There is always the fear that he is going to be hurt, besides the actual sickening pain when the viscera are being handled, which in some cases produces faintness, even collapse. It must be conceded that, valuable as the method is, it should be used as an adjuvant to, rather than as a supplanter of, general anesthetics.]

H. E. Kendall,[1] by the **hypodermic injection of hydrogen dioxid,** has produced a sufficiently profound anesthesia to incise abscesses and even open the pleura and peritoneum. The area becomes as hard as frozen tissue, the pressure producing the insensibility.

ESOPHAGUS AND STOMACH.

E. J. McWeeney[2] reports a case of **rupture of an apparently healthy esophagus** and collects and classifies 17 cases of undoubted rupture of this organ. In collecting these cases the author has been careful to exclude the ruptures caused by foreign bodies from within, such as bones, false teeth, etc. Also cases of malignant and benign ulceration are ruled out. Cases of erosion of the esophagus due to pressure of aneurysms, tumors, etc., are also not included in his table. The first case of rupture of an apparently healthy esophagus is that of a Dutch admiral, which was reported in 1724 by Boerhaave. This case is unique in that the rupture was transverse and involved the whole caliber of the gullet. In other respects the case is quite like the others reported. Fitz's case is unusual because the patient lived for 7½ days after the rupture. From a study of the cases collected McWeeney makes the following summary regarding symptoms, etiology, etc. In only one instance was the patient a woman. The patients were usually in the prime of life, the average age being 42 years. In all of the cases there was a distinct history of excessive drinking. In each case the rupture occurred either during vomiting or while the patient was straining in an effort to vomit. The patient complains of a sensation of "something giving way" followed by pain of the most agonizing character, which is speedily followed by collapse and usually dyspnea. The patient assumes a characteristic attitude—sitting up with the trunk stooped forward as much as possible. The most striking of all the symptoms, and one most constant, is emphysema, which appears first in the neck and then spreads to the face and down the trunk, reaching sometimes to the thighs. This condition was marked in 12 of the 17 cases. The average duration of life after the rupture was 17 hours. Fitz's case is a marked exception to the rule in this respect. In all the cases excepting Fitz's the opening was immediately above the diaphragm, and in all excepting that reported by Boerhaave the rupture was longitudinal. In most instances the rupture occurred into the left pleural cavity, but occasionally into both. In one instance the pleural cavity was not invaded. The author discusses carefully the various theories

[1] Semaine Méd., Nov. 7, 1900.

[2] Lancet, July 21, 1900.

regarding the cause of this condition, and inclines rather to the opinion of Zenker and von Ziemssen, who consider the rupture the result of a digestive softening of the esophagus occurring *intra vitam* in persons who are quite well in other respects. These authorities consider regurgitation of stomach-contents rich in pepsin and acid, the protracted retention of regurgitated food in the esophagus, and the cessation or great weakness of the circulation essential conditions to softening of the esophagus. After a careful consideration of the various theories put forth McWeeney says: "The conclusion to which I have arrived as the result of a careful study of existing data is, that the two main factors that are operative in causing rupture of the macroscopically normal gullet are (*a*) softening of the coats and (*b*) sudden increase of pressure from within. The softening is due partly to intravital digestion, and partly (at least in the case which I observed) to inflammatory infiltration. The intravital digestion is to be accounted for by (*a*) circulatory disturbance, which in my case took the form of venous thrombosis, and (*b*) prolonged sojourn of peptic matters in the gullet from prolonged retching. The increased pressure from within is doubtless ascribable to the violent propulsion of the gastric contents into the lower part of the gullet while its upper outlet is obstructed by the contracted state of the muscle; in other words, to want of coordination of the muscular action of the tube, probably due to exhaustion from prolonged overactivity. Whether a localized phlegmonous esophagitis—for that is the condition which existed in the case now recorded—is a constant factor in these cases, it is of course impossible to assert in the absence of microscopic details of the other cases. I believe I may lay claim to be the first to establish the existence of this condition as a possible cause of rupture of the apparently healthy gullet."

Downie and Kennedy [1] report 2 interesting cases of **stricture of the esophagus treated by gastrostomy.** The first case was that of a married woman 32 years old, who suffered from an extensive ulceration of the esophagus together with excessive thickening in the tissues about this organ. This patient was operated on after the manner of Frank. It is now 16 months since the operation and there has been some contraction of the opening and also a tendency to the production of a hernia of the stomach. Although the patient is able to feed herself comfortably, the disease of the esophagus has progressed. Both recurrent laryngeal nerves have become involved and produce a bilateral abductor paralysis of the vocal cords. There is little change in the voice, but the patient suffers from shortness of breath upon the slightest exertion. In the second case the patient was an unmarried woman aged 31, who suffered from a tuberculous ulceration of the esophagus. In this case the Witzel operation was done. The patient survived the operation only 6 weeks, but was rendered much more comfortable. It is thought that in the majority of cases Frank's operation is better than the Witzel, since it can be more readily performed and offers perfect security

[1] Brit. Med. Jour., Nov. 17, 1900.

against sepsis through the escape of stomach-contents. Another advantage of this operation is that buried sutures need not be used.

Veiel [1] presents a study of 22 cases in which **operative treatment for diverticula of the esophagus** has been employed. The usual symptoms produced by a diverticulum are a peculiar noise during deglutition and a gradual increasing interference with this act; also, a tumor may frequently be observed just in front of the sternomastoid muscle when the patient has rapidly imbibed a considerable quantity of fluid. Eructation of food and liquids is apt to occur during coughing or when the patient leans forward. The diagnosis can be confirmed by the passage of an esophageal sound into the diverticulum. A vertical incision directly over the tumor is usually employed, although Kocher advocates a transverse incision. After closing the esophagus most operators drain the wound. Food by the mouth should not be given until the fifth day. Invagination of the sac has sometimes been successfully employed. Five deaths occurred in the 22 cases reported, and in most instances death appears to have been the result of faulty suturing of the esophagus or too early feeding by the mouth.

Edmunds [2] reports a very interesting case of **impaction in the esophagus of a plate** containing 3 teeth and 3 hooks, and which was successfully removed by gastrotomy. The patient swallowed the plate during his sleep. A probang and a stomach-tube could both be made to pass into the stomach without much difficulty, although the obstruction was encountered at the lower end of the esophagus. Gastrotomy was done on the third day and the plate removed. Feeding by the mouth was started on the fourth day. The wound healed promptly and the patient made a good recovery. Subsequent to the operation the patient suffered no pain and was entirely free from vomiting or any dyspeptic symptoms whatever.

George W. King [3] discusses the question of **foreign bodies in the esophagus** and reports an interesting case of a tin whistle lodged just below the level of the cricoid cartilage, and in which he removed the foreign body successfully by performing an esophagotomy. In this case the probang could be passed into the esophagus below the foreign body without much difficulty. The author remarks that the surgeon should not allow himself to be misled by the successful passage of an instrument in cases of a foreign body lodged in the esophagus.

Farquhar,[4] in speaking of **cancer of the stomach,** quotes Heiman's statistics collected in 1895 and 1896, which show that cancer of the stomach constitutes 21 % of all cancers. Of men affected by cancer in 32 % the disease was located in the stomach. In women only 13 % showed cancer of the stomach. Regarding the cure of cancer of the stomach, Wolfler is quoted as having found 14 patients who had had pylorectomy done for carcinoma alive and well 2 years after the operation and 10 others well 4 to 8 years after the operation. This makes a total of 24 patients well from 2 to 8 years after pylorectomy. This report of

[1] Beitr. z. klin. Chir., Bd. XXVII, Schluss, H. 3.
[2] Lancet, Feb. 23, 1901.
[3] Med. Rec., Oct. 27, 1900.
[4] Med. Rec., Aug. 4, 1900.

Wolfler was made in 1896, since when great improvements have been made in operative technic. Wolfler finds the mortality in 173 operations performed by Billroth, Czerny, Gussenbauer, Kocher, Mikulicz, and others to be 31 %. Several recent operators have reported a number of cases without a death. Curtis next discusses the cases suitable for radical operation. He states that the mere size of the tumor is no indication as to lymphatic involvement or adhesions, since many very large tumors have been operated upon and found entirely free from these complications. Adhesions may no longer be considered a contraindication to operation, since modern technic has enabled us to remove portions of the colon, liver, and pancreas in operations upon the stomach without greatly increasing the risk. In 14 operations Carle removed a portion of the pancreas in 3 instances. Among the cases in which the patients have survived longest after operation are found some of those in which the adjacent viscera were involved and in which the diseased portions were removed. In speaking of glandular involvement as a contraindication,it is shown that although the glands may be enlarged they are not necessarily carcinomatous, and that when thoroughly removed the prognosis is not interfered with. Cases in which there is glandular involvement are of course the most unsuccessful ones. Curtis suggests that each case be judged upon its own merit as regards radical treatment, and that no fixed rule be laid down regarding the limitations of operative treatment. The great difficulty in the treatment lies in making an early diagnosis. The cases are divided into those which present a tumor and those in which no tumor can be detected. Occasionally a tumor is discovered before any stomach symptoms have developed. Even when the tumor is large the author advises an exploratory operation if the patient is in good condition. Where no tumor can be felt there is much greater difficulty in diagnosis, and unfortunately these cases make up the largest class of cancers of the stomach. Many of the symptoms which are characteristic of the disease present themselves so late that operative treatment is of little avail. Vomiting and dilation of the stomach are both late symptoms. The majority of cases show an absence of or a great reduction in the quantity of hydrochloric acid in the stomach-contents. Lactic acid is usually found and there is also a great reduction of the gastric digestive power for albumen. The muscular function of the stomach is greatly interfered with, which causes retention of food even when there is no pyloric obstruction. Hemmeter and others lay stress upon the microscopic examination of fragments which may be brought away by lavage and also upon the presence of the Oppler-Boas bacillus. It is a mistake to rely entirely upon any one or two symptoms either for a positive or negative diagnosis. A proper consideration should be given to all the symptoms. Rapid emaciation is of great value in making a diagnosis. In any case of serious gastric symptoms which are not relieved by medicinal treatment an exploratory operation should be made. The surgeon should not wait until an absolute diagnosis of carcinoma is made, since if he does this his treatment will probably be too

late. "The modern indications for operation in cases of suspected malignant disease may be stated somewhat as follows: (1) The presence of a tumor; (2) dilation of the stomach; (3) obstructive vomiting; (4) marked chemic changes in the gastric contents, even if other symptoms are slight; (5) hematemesis; (6) severe gastric pain. It will be seen that the above list of indications might lead to the discovery of benign as well as of malignant lesions, but in such a case a cure could be obtained the more easily and the operation would be the better justified." The author refers to the similarity of symptoms produced by chronic ulcer of the stomach and cancer. It is undoubtedly true that cancer frequently develops directly upon the base of an old ulcer. Rosenheim has reported 50 successive cases of cancer of the stomach in which he found 4 instances of a previous ulcer. Boas has also stated that in from 5% to 6% of cases of carcinoma of the stomach the disease has its seat in a previous ulcer of the stomach. Matthiew has reported 3 cases in which symptoms of ulcer of the stomach preceded those of cancer by 2, 10, and 24 years. Curtis reports 3 successful cases of his own in which ulcer of the stomach preceded the development of carcinoma.

Brunner [1] reports an experience with 47 cases of **carcinoma of the stomach.** Only 17 of these occurred in women. The majority of cases occurred between the ages of 50 and 70 years. Fifteen of the 47 cases were not operated upon, and 12 were only subjected to exploratory incision. In 8 instances the growth was removed; in 10 a gastroenterostomy was performed; in 2 instances gastrostomy; and in a single case jejunostomy. In the 15 patients not operated upon the diagnosis was confirmed postmortem in 10. The author thinks the examination of the gastric contents a most important diagnostic aid. In 30 of his patients a tumor was palpable. In the majority of his cases the hemoglobin was greatly diminished. Dilation of the stomach was discovered by the administration of soda bicarbonate and tartaric acid. Of the 8 patients in whom resection was employed, 2 recovered, one of whom was free from recurrence 2 years after operation and the other showed no evidence of disease after 3 months; 2 of the patients died in the hospital, and 3 died of recurrence 1 year and 6 months after operation. The author employed Billroth's method of operation and used silk sutures. He removed enlarged lymphatic glands when found. In one patient the suture gave way, producing a fatal peritonitis.

Hartmann and Silhol [2] reported to the Société de Chirurgie de Paris the results of extensive **examination of the blood in cases of cancer of the stomach.** They assert that the examination of the blood gives promise of being more useful than a chemic examination of the gastric contents from a diagnostic point of view. A decided leukocytosis together with a well-marked anemia, they maintain, is indicative of cancer of the stomach. The anemia is not so much marked by a diminished number of globules, but by a decrease of the hemoglobin in the globules and by changes in the form of the globules. Considerable inequality is observed in those globules which are not deformed.

[1] Cor.-Bl. f. schweiz. Aerzte, Feb. 1, 1901. [2] Rev. de Chir., No. 2, 1901.

To be of diagnostic aid the leukocytosis must be very marked and should affect particularly the mononucleated cells. [Our experience has been that leukocytosis is an uncertain attendant upon malignant disease, and occurs in those cases in which a malignant growth is associated with ulceration or an inflammatory complication.]

W. J. Mayo,[1] in speaking of **cancer of the stomach and pylorus,** says that the disease is most rare under 30 years and that the majority of patients die within a year. The slightest suspicion of malignant disease should cause the physician to consult a surgeon. The diagnosis cannot be made upon any one or two symptoms, but must depend upon the association of a number. When a patient of middle or advanced life with a history of previous good digestion begins to complain of pain in the gastric region, with difficult digestion, loss of appetite, progressive loss of flesh, and vomiting, cancer of the stomach should be strongly suspected. If all of these symptoms, however, are present, the probability is that any operative interference will only prove of temporary aid. Successful treatment of these cases depends upon a prompt radical operation after an early diagnosis. The structure of the neoplasm, its location, lymphatic infection, and the involvement of neighboring viscera all affect the prognosis.

Mintz [2] reports a case of **primary sarcoma of the stomach.** His patient was a man aged 30, who had suffered with pain, eructations, indigestion, and increasing weakness for one month. Occasionally vomiting took place. Food always produced pain. The left testis had shown some enlargement for a number of weeks. The patient was cachectic and jaundiced. A tumor was easily palpable in the gastric region. The stomach-tube brought up a large amount of decomposed food. There was an absence of hydrochloric acid, lactic acid was present to a large degree, and the Oppler-Boas bacillus was found. Mintz supposed the case to be one of carcinoma of the pylorus with metastasis in the testicle. Gastroenterostomy was decided upon, and when it was done the tumor was found to occupy the right half of the stomach. The patient died 4 weeks subsequent to operation. At the postmortem it was found that the pylorus was adherent to the liver, which accounted for the jaundice. An ulcer of the pylorus was found in addition to a large, hard tumor the size of a fist. Lymphatic glands in the neighborhood were greatly enlarged. Upon microscopic examination the growth proved to be a lymphosarcoma. Mintz has collected all the reported cases of sarcoma of the stomach, 55 in number. After reviewing the clinical history of the disease, he maintains that in making a diagnosis of gastric tumor sarcoma should be given more consideration than has heretofore been allowed it.

George Dock,[3] in discussing the subject of **sarcoma of the stomach,** reports a case and adds 10 others which he has been able to collect from recent literature to those already reported. Three of these 10 are his own cases. Sarcoma of the stomach is much more frequently secondary

[1] Ann. of Surg., Aug., 1900. [2] Berlin. klin. Woch., 1900, No. 32.
[3] Jour. Am. Med. Assoc., July 21, 1900.

than primary. The growth may be found at any part of the stomach, although the greater curvature is most frequently its seat. The size of the tumor and its variety vary. Usually the growth attains a considerable size. In 2 reported cases the tumor weighed 12 pounds. An examination of the stomach-contents showed, in all the cases excepting one of the author, that hydrochloric acid was absent and lactic acid present. Not infrequently blood was found in the stomach-contents. The diagnosis was very seldom made during life. The duration of the disease is usually from 1 to 1½ years. Dock's patient was a man 55 years old, who for several years had suffered with gastric symptoms. The patient greatly improved under medicinal treatment, but rapid loss of weight with distention of the stomach continued. Repeated examination of the stomach showed hydrochloric acid present and lactic acid absent. The blood examination was negative. About one-third of the stomach, including the tumor, was resected, and recovery followed. At the time of the report the patient weighed more than ever before.

Charles F. Steele [1] reports a case of **carcinoma of the stomach** in which there were practically no symptoms of the disease until the day before the patient's death, when a diagnosis was made. The patient was a man aged 46. He complained of pain in the lower right chest and behind the lower ribs. There was some tenderness in this region upon pressure. The liver was not enlarged. Rapid debility developed, with an increase of pain in the back and right chest. The pain was greatly aggravated upon movement in bed. There was never any nausea or vomiting and food was taken and retained. When a great deal of weight had been lost a careful examination of the abdomen revealed the presence of 2 hard lumps in the gastric region. The patient died the day after the tumor was found, and a necropsy revealed a carcinoma involving the posterior wall of the stomach.

Thos. H. Manley,[2] in giving a clinical report of 3 cases of perforation of the alimentary canal, reports a case of **cancerous perforation of the stomach** in a woman 29 years old. In this case diagnosis of the condition was very difficult. An exploratory incision revealed a large cancerous perforation of the fundus of the stomach near the cardiac end, about which extensive adhesions had taken place, preventing infection of the general peritoneum. The patient died from shock shortly after the operation.

Branham [3] describes a case of **adenocarcinoma** for which he successfully performed pylorectomy. An end-to-end anastomosis of the stomach and duodenum was made by means of a Murphy button. The button was recovered from the rectum 18 days after the operation. Six months after operation the patient's weight had increased from 84 to 147 pounds. Examination of the growth showed sufficient glandular structure to allow of the designation adenocarcinoma. The author discusses at some length the mortality of pylorectomy for malignant disease of the stomach. Kocher has reported 57 cases with a mortality of less than 9%. The

[1] Lancet, Dec. 8, 1900. [2] Va. Med. Semi-month., Jan. 11, 1901.
[3] Phila. Med. Jour., Sept. 29, 1900.

remote results have been particularly gratifying. Kocher reports a woman living 10 years without recurrence, another 5, another 3, and a third 2 years. Four of Kocher's patients died of other diseases without recurrence after 3 years. Kocher's method is first to do a gastroenterostomy and later perform pylorectomy. He does not use the Murphy button. Mayo, of Rochester, Minn., has had 5 successful cases and no failures, and employed the button in each case. The author thinks that gastric lavage after operation was of the greatest advantage in the case which he reports. Lavage and dieting previous to operation often greatly relieve the symptoms and cause the physician to entertain a false hope of recovery.

MacDonald [1] considers the subject of **surgical intervention in carcinoma of the stomach.** The symptoms which in the author's opinion would indicate an exploratory operation are a chronic gastritis of progressive character, which does not improve under proper medicinal treatment; a loss of gastric motility; a gradually increasing diminution of gastric peristalsis; a progressive diminution of free hydrochloric acid; emaciation even under forced feeding; and a reduction of the hemoglobin, especially if associated with a marked leukocytosis. He argues that although carcinoma may not be found when the exploratory incision is made, yet some condition will be met which can be relieved by surgical interference. McArdle, in 1342 cases of carcinoma of the stomach, found the disease limited to the pylorus in 802, and in more than one-half of these there was no important lymphatic involvement. Gussenbauer, in studying 542 cases of carcinoma of the pylorus, states that in 41 % there was no metastasis, and that in 37 % there were no adhesions. MacDonald's article is illustrated by a number of excellent drawings showing the various steps of a pylorectomy.

Alfred King [2] reports a **successful case of pylorectomy in a man aged 71 years.** An examination of the patient revealed a dilated stomach and a freely movable tumor about the size of a goose's egg just above the umbilicus. The patient's urine was scanty, contained no albumin or sugar, but both hyaline and granular casts were present to a considerable extent. After the stomach had been thoroughly washed out the location of the tumor was found to be considerably higher than before the lavage. When the abdomen was opened the tumor was observed to involve the pyloric end of the stomach only; there were no adhesions nor was there any noticeable lymphatic involvement. The operation lasted a little over 3 hours. The patient stood the operation well, no stimulation was required during its performance, and he made an excellent recovery. Small amounts of liquid were given at frequent intervals shortly after the operation. Feeding, however, was largely done by the rectum. Nine months after the operation the patient is comfortable and enjoys excellent health. He has gained 14 pounds in weight during the last few months. The portion of the stomach and duodenum removed measured 4 inches in length. The entire circumference of the pylorus was involved in the growth. An examination

[1] Albany Med. Ann., May, 1901. [2] Med. Rec., May 11, 1901.

of the tumor showed it to be a scirrhous carcinoma. [This operation well illustrates the way in which elderly persons may tolerate prolonged operative procedures.]

Enderlen [1] has experimented extensively in order to obtain the **repair of wounds of the stomach by means of a transplanted portion of the omentum.** The author refers to a number of reported cases in which this means of closing or protecting a gastric wound has been employed, and gives the results of his own experiments on cats and dogs. He shows that after excising a portion of the stomach and closing the aperture by means of the omentum this latter tissue gradually assumes the characteristics of gastric mucous membrane. It was found that well-developed glands developed in the transplanted portion of the omentum.

De Carvalho,[2] of Sao Paulo, Brazil, reports a case of **total gastrectomy.** The patient was a mulatto woman aged 46, a native of Brazil. She was extremely emaciated, weighing only 68 pounds. A tumor the size of a turkey's egg was easily palpated in the upper gastric region on the right side. The abdomen was opened with the intention of doing a gastroenterostomy. It was found, however, that the growth involved the entire pylorus, presented some adhesions to adjacent organs, and that the lymphatic involvement was quite extensive. A total gastrectomy was determined upon. The removal of the stomach was accomplished with a great deal of difficulty, and during its execution the pancreas was torn, producing considerable hemorrhage. The removal of the viscus was also obstructed by a very large right lobe of the liver. The patient was considerably shocked, but improved after the intravenous injection of salt solution. De Carvalho reports the case about 10 days after the operation, at which time the patient was doing well.

W. H. Brown [3] relates a most **unusual complication following gastrojejunostomy.** The patient was a woman 62 years old, who suffered from a cancer of the pylorus with extensive lymphatic involvement. A gastrojejunostomy was performed with the aid of Senn's plates. The patient did well for 2 weeks, the vomiting having entirely ceased and the pain having subsided. At this time, however, symptoms of obstruction began to reappear. The pain again returned and regular vomiting began. The author, seeing that the patient's condition was desperate, determined to open the abdomen again and see if he could not remove the cause of her distressing symptoms. The anastomosis, from an examination of its exterior, was found perfectly satisfactory. The stomach was opened and it was discovered that a thin membrane had formed over the new opening between the stomach and bowel. This appeared to be about the thickness of note-paper. The membrane was torn through with the finger and the opening dilated. After this second operation vomiting continued for a day or two, but gradually disappeared. At the time of the report the patient was able to take ordinary food and do her housework. Brown can give no satisfactory explanation of this unusual complication.

[1] Deut. Zeit. f. Chir., Apr., 1900. [2] Lancet, Sept. 15, 1900.
[3] Lancet, July 7, 1900.

Boeckel,[1] in presenting an account of a case of **total gastrectomy,** discusses the indications for and technic of this operation. In his own case the cancer involved the lesser curvature and almost the whole of the posterior wall of the stomach. The patient was a woman aged 38, who made a rapid recovery after the operation. The author thinks that in the future there is a probability of this radical operation being done for other conditions than cancer. When the malignant growth is sharply circumscribed the prospects of success are very good. The author asserts that total gastrectomy compares favorably, as regards mortality, with partial resection of the stomach. That his patient has no difficulty in digestion, and that her assimilation is good is shown by the fact that she has gained considerably in weight since the operation.

Ricard [2] showed before the Academy of Medicine of Paris a patient aged 52, from whom he had, 11 months previously, removed nearly the entire stomach, the first portion of the duodenum, and a part of the pancreas for an extensive carcinoma. Since the operation the patient has greatly increased in weight and enjoys good health.

Villard [3] describes a case in which he united the right extremity of the greater curvature of the stomach with the descending portion of the duodenum. In cicatricial, noncancerous, or spastic pyloric obstruction, and in old ulcers, the operation of **gastroduodenostomy** is highly recommended. The bowel may be united to either the anterior or posterior surface of the stomach. The author, however, prefers the posterior wall. After the operation it is his custom to allow liquids to be given at once in dram doses, excepting water and gaseous fluids. Morphia is used during the first day or two after the operation. Among the advantages claimed for this operation are the emptying of the gastric contents above the biliary and pancreatic ducts, the brevity and simplicity of the operation, and the avoidance of double anastomoses, as are frequently made in uniting the stomach with the intestines.

Arthur D. Bevan,[4] in considering the question of **pylorectomy for cancer,** reports a very interesting case in which prior to operation a diagnosis of gastric ulcer had been made. The patient was suddenly seized with symptoms indicative of perforation, and a hasty operation was performed. When the abdomen was opened the expected condition was discovered, the stomach-contents having been poured into the general peritoneal cavity. It was found, however, that the patient was suffering from a carcinoma involving the pylorus and the anterior wall of the stomach. This portion of the organ was resected and gastroenterostomy was performed with the aid of a Murphy button. The patient is alive 8 months after, but shows evidence of recurrence. The author reports another case in which he removed about one-fourth of the stomach for carcinoma. Bevan thinks that there is greater safety in anterior gastroenterostomy than in the posterior operation. He is convinced, also, that in anastomosing the intestine, or the stomach and intestine, continuous sutures are much to be preferred to interrupted sutures.

[1] Bull. de l'Acad. de Méd., No. 1, 1901. [2] Giornale Inter. de le Scienze Mediche.
[3] Rev. de Chir., Oct., 1900. [4] The Practitioner, Mar., 1901.

MacDonald [1] carefully describes the **improved technic in the operative surgery of carcinoma of the stomach.** In investigating the literature regarding the operation of pylorectomy he has been able to find 43 cases in which the operation was performed for carcinoma and in which the patients were living without recurrence 3 years after the operation. Some of the patients were alive 10 years after the operation. These cases were collected from 527 operations done for pyloric cancer, with an immediate mortality of 31%. It is shown that the recent improvements in technic have been accompanied by both a decreased immediate mortality and much better permanent results. Whereas formerly it was considered only proper to operate in the presence of a palpable tumor, it is now the object of the surgeon to operate long before the growth reaches this degree of prominence. [The indications for an exploratory operation may be found in the same author's article on **surgical intervention for carcinoma of the stomach.** See page 80.] When the cardiac end of the stomach is involved in the disease there is much more apt to be extension to the esophagus than there is apt to be extension to the duodenum when the pylorus is involved. In a complete pylorectomy it is very desirable to remove the lymphatics along both curvatures of the stomach as well as those lying behind the pylorus. In excising a malignant growth it is urged that the excision should be at least 3 cm. from the border of the disease. The author has found great satisfaction in the use of the clamps devised by Kocher. He invariably employs the Murphy button.

F. Kammerer [2] presented 2 cases before the New York Surgical Society in which he had **removed the greater part of the stomach for malignant disease.** The first patient was a man aged 31, who had suffered with stomach symptoms for 8 months. In this case a palpable and fairly movable tumor was easily demonstrated before operation. Hydrochloric acid was absent and lactic acid present in considerable amount in the stomach-contents. The growth was found to extend from the pylorus along the entire lesser curvature of the stomach. In the removal of the growth the author employed Kocher's clamps. A few enlarged lymphatic glands were removed. Both the cut end of the duodenum and the remaining portion of the stomach were completely closed and a posterior gastroenterostomy was done with the aid of a Murphy button. Great difficulty was experienced in suturing near the cardiac end of the stomach. The button was passed on the seventeenth day. In the 2 months since the operation the patient has gained 20 pounds. The second case was that of a man 45 years old, who had presented symptoms for 4 months. In this patient also a small tumor was palpable in the right hypochondrium. When the abdomen was opened the growth was found to occupy the pylorus and a greater portion of the lesser curvature. The steps of the operation were exactly those of the previous one. The patient made a good recovery and the button was passed on the tenth day. The author referred also to 3 other patients from whom were removed larger portions

[1] Ann. of Surg., Feb., 1901. [2] Ann. of Surg., Feb., 1901.

of the stomach with a fatal issue in each. One patient died on the twelfth day because of the failure to remove a gauze tampon from the abdomen; the second of pneumonia on the sixth day; and the third, from whom a large portion of the mesocolon and the head of the pancreas were removed, died on the third day from shock. In all of these fatal instances perfect union had taken place and no leakage had occurred.

A. H. Cordier[1] read before the New York State Medical Society a paper in which he discussed **gastrojejunostomy in gastrectasis.** While gastric dilation in the majority of cases is due to some form of pyloric obstruction, there are other cases in which it is the result purely of a muscular atony-myasthenia. Carcinoma frequently produces the dilation, but it must be remembered that the extension of cancer is frequently so rapid that the patient dies before dilation occurs. In the majority of instances the gastrectasis is not due to malignant obstruction. The author lays great stress upon this fact because many medical men advise against operation when dilation is present, because they suppose it to be due to malignant disease. As dilation progresses the power of contraction of the stomach is lost. It is urged that in operating for this condition the anastomosis with the intestine should be made at the most dependent part of the stomach. Many cases of failure have resulted from neglect of this rule. Stomach atony is best determined by the salol test. If the salol passes into the intestinal canal its presence can be demonstrated in the urine at the end of 2 or 3 hours by the addition of a drop of the tincture of the chlorid of iron, which produces a violet color. The author has experienced most satisfactory results from gastroenterostomy in these cases. It is shown that the capacity of the stomach may be very great and yet the function of the organ remain undisturbed. Such cases do not require surgical treatment. The author does not underrate the less radical means of treating atonic dilation of the stomach, but says that when these have been carefully given a fair and conscientious trial and have failed, surgical intervention should be employed. Loreta's operation for pyloric stenosis is not looked upon as a satisfactory procedure. Pyloroplasty promises much better results. Cordier does not look with much favor upon pylorectomy for malignant disease of the pylorus. He asserts that the mortality must be placed at 50% or 60%, and that the average duration of life after operation is only 11 months, and that with these results gastroenterostomy in malignant disease of the stomach compares favorably. He thinks that the importance of gastrojejunostomy as a drainage operation has not been dwelt upon sufficiently. Anastomoses formed at the lower anterior surface of the stomach have been about as satisfactory as those formed at the posterior surface. When the stomach is very much dilated sufficient "slack" must be allowed in the small intestine so that when the stomach contracts to its normal condition there will be no constriction of the colon. In all of his operations Cordier has used the Murphy button. The author concludes his article as follows: "(1) Can-

[1] Am. Med., Apr. 13, 1901.

cer of the pylorus, even though removed, returns quickly, and always kills. Pylorectomy is attended by a high mortality and is not a justifiable surgical procedure in advanced carcinoma of the pylorus. Gastrectasis due to a malignant closure of the pylorus is best treated by a gastrojejunostomy. The operation advised by Wolfler or von Hacker best meets the indications. (2) It is not necessary to twist the bowel, in making the anastomosis, to prevent bile from entering the stomach. (3) The anastomotic opening in the stomach should be at the most dependent point of the dilated organ. The operation is attended by a low mortality. In all cases in which marked dilation of the stomach exists, accompanied by emaciation, pain, and invalidity, the operation of gastrojejunostomy should be performed. The relief of pain, due to the effort of the stomach to relieve itself, follows this procedure at once. The patient gains rapidly in weight, and if the disease is nonmalignant his former good health is restored."

Charles S. Fisher [1] writes a paper on the **gastric functions before and after gastroenterostomy.** His conclusions are founded on a number of cases operated upon by Weir. These patients were all studied carefully for a number of months, and in some instances for years previous to operation and for the same length of time afterward. His observations are directed to determining the functions of the stomach and its size and position before and after operation. The history of each case is minutely reported. The number of cases, the author thinks, is not sufficient to draw general conclusions from, but, at the same time, his discussion of these particular cases is worthy of the most careful consideration. It is asserted that the real value of the operation can only be judged after several years, because the immediate results are so pleasing to the patients that they are apt to overestimate their improvement and often produce a relapse by indiscretions in diet. Considerable space is devoted to the question of the secretion of hydrochloric acid and to the motility of the stomach. In the majority of instances the motor functions return to the normal, and in but 1 case did the dilation apparently persist after operation. The hyperacidity has been variously affected by the operation; in two cases it has persisted from one to two years after operation. It is generally thought that where hyperacidity is of long standing it may recur in neurotic patients from emotional excitement. It is also shown "that hypertrophic or atrophic changes of long duration may be progressive after operation." The presence of bile after operation was demonstrable in most cases, but produced no disturbance. One of the great benefits obtained by gastroenterostomy is the regulation of the action of the bowels. "Whether or not a hyperchlorhydria is to recede after operation depends in a certain proportion of cases upon the structural changes which have taken place in the mucous membrane." In Cases I and IV we have diametrically opposed conditions. In one we have hyperacidity due to cell proliferation, and in the other progressive subacidity due to cell atrophy, and in both there was marked improvement in the general

[1] Med. Rec., Sept. 8, 1900.

nutrition and local distress; yet in both, 1 and 2 years after operation, we find that the abnormal conditions of secretion have progressed in their respective directions.

In discussing **intestinal and gastrointestinal anastomoses** before the Thirteenth International Congress of Medicine, Roux,[1] of Lausanne, expressed the opinion that lateral apposition was the most practicable of all operations. Gastroenterostomy should precede pylorectomy if the state of the patient's health renders it desirable. In nonmalignant disease of the pylorus and stomach, where easy evacuation of the stomach-contents is the only aim, gastroenterostomy is preferable to either pylorectomy or pyloroplasty. This operation is also much superior to gastroplication and gastropexy. Roux considers Murphy's button the best mechanical aid to anastomosis, but reserves its use for those cases in which time is an important factor. Dr. Souligoux expressed much the same views as Roux.

Heinrich Hildebrand[2] advocates a **modification of the Murphy button for gastroenterostomy** which will prevent its falling back into the stomach. The button is constructed so that the intestinal half is much larger and heavier than the stomach half. The button has been used by Kummel with good results.

Nicoll[3] reports a case of **congenital hypertrophic stenosis of the pylorus** in which success attended dilation by the method of Loreta. The patient was a child 5 weeks old, who vomited the entire contents of the stomach within 15 to 20 minutes after meals. There was no hiccough, nausea, or pain. Twelve and a half months after operation the child is in excellent health. The author discusses the various theories regarding the causation of this condition.

Fred. D. Bird[4] contributes an article on the subject of **perigastric adhesions.** In discussing the subject the author leaves out of consideration the denser adhesions such as accompany advanced tuberculous peritonitis and such as are found when the abdominal viscera are firmly matted together. It is to the slighter adhesions that the author calls attention. These are classified according to their cause in the following way: (1) Those induced by gastric and duodenal ulcers; (2) those resulting from infection from the bile-duct; (3) those due to syphilis; (4) those of uncertain origin; (5) some cases undoubtedly traumatic in origin. By their symptoms, they may be arranged thus: (1) Those which cause pain as *the* clinical symptom; (2) those which constrict natural passages; *e. g.*, the bile-ducts or the duodenum, causing jaundice or distention of the gall-bladder in one case, and dilation of the stomach as the chief clinical phenomenon in the other. Bird has operated upon 20 cases of the slighter forms of perigastric adhesions, and in the large majority of instances the results have been very satisfactory. All of the patients recovered. Those who were not entirely cured were greatly relieved. A brief history is given of 3 patients all of whom were permanent invalids and able to do no work. In each the adhesions were

[1] Lancet, Aug. 11, 1900. [2] Centralbl. f. Chir., June 30, 1900.
[3] Pediatrics, Feb. 1, 1901. [4] Intercolonial Med. Jour. of Australia, Dec. 20, 1900.

due to a gastric ulcer which had healed. Entire restoration to health followed the operation. The adhesions found are thin and slight in appearance and yet are very strong, feeling like thin strands of wire. If the omentum is fatty or the colon heavy, the dragging produced upon the stomach by these adhesions is very great. When the stomach becomes filled and changes its position these bands will produce pain. The adhesions often take place between the omentum and the stomach, nature carrying, as it does, the omentum to any dangerously inflamed portion of the stomach. In the majority of instances Bird thinks the adhesions will be found in close connection with the gall-duct and lesser omentum. Extensive scarring inside of the alimentary canal does not necessarily indicate extensive adhesions of the serous surfaces. It is thought that many of the adhesions found in the neighborhood of the gall-ducts, producing chronic indigestion and discomfort in the upper abdomen, are due to cholangitis of a degree sufficient to allow the passage of bacteria to the serous surfaces. These adhesions are often found when no gall-stones have been present. Bird says that he is sure these lesser adhesions which form about the bile-ducts are frequently overlooked and that they are not given the consideration which is due them. Regarding the reforming of these adhesions, it is said that this will occur if the original cause of them is present. This, however, is not usually true, and operation gives relief. A case which illustrates well a number of the points Bird makes is that of a man 66 years of age who had always been healthy until a few months previously, since which time he had suffered much pain and distress in the right epigastrium. The patient was slightly jaundiced and the right rectus was quite rigid in its upper portion. The abdomen was opened and bands were found about the bile-ducts. While the author was breaking up these bands with his fingernail the gall-bladder suddenly emptied itself into the duodenum. Complete recovery followed the operation. It is difficult to speak definitely of those adhesions which are described as syphilitic. It is thought that to say they are caused by syphilis is going too far, the truth probably lying in the fact that syphilis produces a tendency toward adhesion formation. Bird agrees with Mayo Robson that syphilis of the stomach should be included among the causes of perigastric adhesions. In referring to the symptoms of perigastric adhesions it is remarked that it is easier to describe those of the denser forms than to produce a clinical picture of the slight wiry adhesions. Epigastric pain, started or increased by any sort of food, is the main characteristic. Adhesion pain anywhere in the abdomen is definitely localized; the patient can put his finger right over the spot where operation subsequently proves the lesion to be. This contrasts markedly with acute inflammatory pain, which may be referred to a position far from the inflamed spot. Then there is more or less discomfort in connection with food, for which Calwell has coined the excellent term adhesion-dyspepsia, the pain of which, he says, comes on half an hour after food, and so is intermediate between the immediate pain of ulcer and the delayed pain of atonic dyspepsia. Calwell, however, refers to the grosser forms, as

does Robson, when he lays stress on the fact that the pain and discomfort are at once relieved by the recumbent posture. Some of my cases showed this, and others did not, but as Robson says, a necessity to lie down or rest after each meal is suggestive. Movement is calculated to, and does, arouse or aggravate the pain; the erect posture will tend to cause dragging on the adhesions, and the fullness of the stomach or colon will assist. The severity of the pain is no index to the size of the adhesion, and the pain may range from a dull localized ache to what may truly be termed agony, with the presence of thin streaks of adhesions. The most valuable diagnostic sign is a persistent definitely localized epigastric pain without the inflammatory accompaniment of fever. When the stomach is filled moving about may produce pain. The recumbent position after a meal may relieve this pain, and if it does perigastric adhesions should be thought of. Vomiting is not a prominent symptom, and the vomited material shows that gastric digestion has taken place. Jaundice is an accident due to the situation of the adhesions, but is frequently present. The futility of all medical or hygienic treatment is an aid to diagnosis. Bird calls attention to the fact that in opening the abdomen it is a mistake to regulate the incision according to the position of the ensiform cartilage, because this cartilage varies in position as the shape of the chest varies. In searching for adhesions the gall-bladder should be the starting-point. Considerable bleeding may accompany the breaking up of the adhesions, and it is useless to look for the bleeding-point since sponge pressure will in all instances control the hemorrhage. The pylorus cannot be thoroughly examined unless the surgeon tears through the anterior layers of the greater omentum, exposing the posterior surface of the stomach. It is very rarely necessary to ligate the adhesions before dividing them.

Rolleston and Crofton-Atkins [1] report an interesting case of **congenital stenosis of the pylorus due to hypertrophy.** Vomiting and convulsions first occurred about a fortnight after birth. These grew worse and were not in any way relieved by treatment. Five days before death the vomited material contained blood. No tumor at any time was palpable. The child died when 7 weeks and 5 days old. At the necropsy it was found that the pylorus was so much hypertrophied as to occlude its lumen almost completely. The mucous membrane was healthy, the hypertrophy being confined largely to the muscular layers. The authors have collected from literature 44 other cases of congenital stenosis of the pylorus.

F. S. Watson [2] describes **two forms of hour-glass stomach, one congenital and the other acquired.** The only positive indication of the congenital nature of this condition is the absence of any pathologic process connected with it. Among the causes of the acquired variety are cicatrices of former ulcers, or adhesions resulting from these, which attach the stomach to neighboring organs, and, occasionally, adhesions which arise from inflammation outside of the stomach. In rare instances the contraction may be brought about from cicatricial deposit following

[1] Brit. Med. Jour., Dec. 22, 1900. [2] Ann. of Surg., July, 1900.

the ingestion of caustics. The constriction usually occurs about the middle of the stomach. It is more frequent among men than women, and usually occurs between the thirtieth and sixtieth years. The symptoms much resemble those of benign stenosis of the pylorus; it may, however, be differentiated from the latter condition. Fluid injected into the stomach may seem suddenly to disappear and not return through the irrigating tube. Again, when the stomach has been apparently washed perfectly clean there will suddenly be returned through the tube a large quantity of partially digested food which has been regurgitated from the second division of the stomach. Sometimes the injection of fluid into the stomach will demonstrate the distended organ on the left side, which may gradually disappear with the development of a similar distention on the right side. Vomiting is a most constant symptom, occurring very soon after taking food. Loss of weight is a frequent symptom. Gastric pain may be present and is sometimes quite severe. The treatment of the condition is purely surgical, gastroanastomosis being the most serviceable operation.

Childe[1] reports a case of **hour-glass stomach** in which the diagnosis was made of probable malignant disease. The abdomen was opened with the intention of doing a gastroenterostomy. The pylorus was found to be fixed and to contain a hard swelling posteriorly. Von Hacker's posterior gastroenterostomy was performed. The patient died on the fifth day after operation. A necropsy showed that the stomach was constricted about its middle and that the bowel had been united to the second portion of the stomach. The left portion of the stomach occupied a position very high up under the ribs and was not observed at the time of operation. This position of the first portion of the stomach was due largely to the peculiar formation of the chest-wall.

Martin and Pollard[2] report a case of **hour-glass stomach,** in which the same error was made in performing gastroenterostomy.

Nathan Jacobson[3] describes the successful removal of a **hair-cast of the stomach.** The patient was a girl 11 years old, who from her earliest years had been accustomed to bite off the ends of her hair. She said that she enjoyed the tickling sensation produced by the transit of the hair to the stomach. The patient made a satisfactory recovery. The only case of this kind known to have occurred in a male occurred in the year 1779. The patient was a boy aged 16. The author has been able to collect 19 cases of hair-cast of the stomach, 10 of which were discovered postmortem and 9 upon the operating table. In no case was a correct diagnosis made before the operation or necropsy, and in no instance was a foreign body in the stomach suspected. The condition was usually supposed to be a growth of the spleen or omentum, a movable kidney, or an impaction in the colon. Two of the patients were pregnant, and in both of these instances vomiting was very severe. In only 1 other case than his own did Jacobson find the regular recurrence of severe pain at night and while the patient was in the recumbent

[1] Brit. Med. Jour., Mar. 23, 1901. [2] Brit. Med. Jour., Dec. 8, 1900.
[3] Med. News, Feb. 16, 1901.

position. The symptoms in these cases vary greatly. Rarely or never has the discovery been made that the patient was a hair-eater until the tumor was found. Usually the hair is bitten off in short pieces, but occasionally very long hairs have been found. In the fatal cases death has been due to a perforative peritonitis. In the 9 cases operated upon the operation was done as an exploratory measure and was successful in each instance. The first successful case was reported by Schoenborn in 1883.

Fred. D. Bird [1] records the case of a woman aged 24 from whose stomach he **successfully removed a large hair-ball.** The patient developed the habit of eating her hair 3 years previously in the delirium of typhoid fever. She was admitted to the hospital for severe vomiting and pain in the left side and back. These symptoms, though less marked, had been present for 6 months. She had lost considerable weight. At the time of admission the patient could keep nothing on the stomach. A large, hard, well-defined tumor could be felt below the left costal margin. The true nature of the condition was not discovered until the abdomen was opened. Its removal was difficult because it was very adherent to the thickened stomach-wall. The patient made a satisfactory recovery, though she vomited considerably on the second day. The stomach was delivered from the abdominal cavity in order to remove the mass of hair. The mass was very septic, having a most disgusting odor. The tumor weighed 11 ounces, was 6 inches long, and measured 10 inches in its greatest circumference.

Mayo Robson,[2] in discussing the **complications of gastric ulcers and their treatment,** excludes from his remarks ulcers due to tubercle, syphilis, and malignant disease. Ulcers of the stomach are divided into "erosions and simple ulcers." The latter ulcers are subdivided into the acute round ulcer usually met with in young women and frequently complicated by hemorrhage and perforation, and the chronic irregular ulcer seen more frequently in men, but not infrequently, according to Robson, met with in women. The most indicative symptoms of gastric ulcer are pain after eating, with vomiting and tenderness in the epigastrium. In many instances no symptoms are presented until there occurs hemorrhage or perforation. The position of the pain is some indication as to the seat of the ulcer. An ulcer on the posterior wall will give rise to more pain when the patient is recumbent, and an ulcer on the anterior wall is more painful when the patient is prone. If the ulcer is at the pylorus the patient is more comfortable on the left side, and the reverse is true if the ulcer is at the cardiac end. Greater tenderness is present if the ulcer is situated on the anterior wall. Vomiting gives marked relief in cases of gastric ulcer, which is not true in cases of cancer of the stomach. Hydrochloric acid in excess favors a diagnosis of ulcer. Blood in the vomit is apt to be free or clotted, but not infrequently resembles the coffee-ground vomit of cancer. Distention of the stomach by the evolution of carbonic acid gas will show whether or not the organ is

[1] Intercolonial Med. Jour. of Australia, Oct. 20, 1900.
[2] Brit. Med. Jour., Feb. 2, 1901.

dilated. Not infrequently in chronic ulcer of the stomach a tumor can be felt. The long duration (often years) of a chronic ulcer will aid in its differentiation from cancer. An exploratory operation should be done for the purpose of making a diagnosis if the following two questions can be answered in the affirmative: "Can an exploratory operation be performed without adding seriously to the risk of loss of life?" "Is it possible that good will result from the exploration?" The treatment of gastric ulcer should be medicinal, but if the ulcer becomes chronic and does not respond to treatment, or should complications arise, surgical interference is strongly indicated. Robson urges that the medicinal treatment should be kept up for a much longer period than is usually the case in order to prevent a recurrence of the disease. In referring to the surgical treatment Robson states that his own mortality in operations for gastric ulcer is below 5%, and he thinks that this could be lowered still more if many of the patients would submit to operation earlier. When medicinally treated throughout the mortality reached is from 20% to 50%. Gastroenterostomy is the operation which the author thinks most universally applicable to these cases, and he always performs a posterior anastomosis. In his last 20 cases the patients have all made good recoveries without complication. Excision of the ulcer is not required in every case. Pyloroplasty may be done if the ulcer is situated in the pylorus, and this part of the stomach is free from extensive adhesion and is not actively ulcerated. Unless these conditions are present gastroenterostomy is the preferable operation. Pylorectomy is seldom indicated for simple ulceration. Dilatation of the pylorus is unsatisfactory. Perforation occurs in about 15% of all cases of ulcer of the stomach. Death does not always occur after perforation, because frequently the stomach is empty and the omentum becomes adherent at the point of perforation. The protection afforded by nature, however, cannot be depended upon, though it may succeed, and if it does, a subphrenic abscess is apt to occur. Robson estimates that hemorrhage occurs in about 80% of cases of gastric ulcer. In a case of acute hematemesis the treatment should be medicinal, but if the hematemesis recurs or if the bleeding has become chronic, surgical treatment should be instituted. Gastric stenosis resulting in dilation of the stomach is not an infrequent complication, and oftentimes requires gastroplication as well as direct treatment of the stenosis. Robson has operated in 11 cases of hour-glass stomach which had resulted from ulcer. Perigastric adhesions very frequently result from ulcerations of the stomach, particularly of the pyloric end, producing dilation and requiring surgical treatment.

Gastric hemorrhage and its surgical treatment is dealt with extensively in a paper by Mayo Robson,[1] delivered before the Edinburgh Medico-chirurgical Society, February 6, 1901. He asserts that gastric ulcer occurs in 5% of the community and that its mortality ranges from 10% to 50%. When a diagnosis of gastric ulcer has been made the serious nature of the disease should be impressed upon the patient, and also

[1] Lancet, Feb. 9, 1901.

the necessity for careful treatment with rest in bed and long-continued care in diet. The mortality of the operative treatment of gastrorrhagia is about 7 %. Vicarious hematemesis at the menstrual period and that occurring after operations respond usually to medicinal treatment, although occasionally surgical intervention must be considered. Operative intervention in these cases, however, has not been productive of very good results. Postoperative hematemesis is accounted for with great difficulty. Many causes of the condition have been suggested, such as injury of the omentum, general anesthesia and sepsis, and yet cases occur where none of these conditions exists. The author thinks that the hemorrhage results in these cases from some reflex nervous influence. Venous hemorrhage of a recurrent nature is much more likely to be benefited by surgical treatment than arterial hemorrhage, and it is the latter which is responsible usually for the fatal cases. The amount of blood lost or the length of the survival after the onset of the bleeding is no indication as to the size of the vessel from which the blood comes. In every case of acute hematemesis the treatment should at first be medicinal, but if no improvement takes place, or if the bleeding recurs, a surgical consultation should be had with the idea of opening the stomach. In cases of recurring hemorrhage it is advised that the stomach should be opened even during the recurrence of the bleeding. In referring to the technic Robson says it is undesirable to wash out the stomach before operation upon a bleeding ulcer. When the abdomen is opened the contents of the stomach can be pressed into the intestine. A puckering of the surface or a thickening of the coats of the stomach will frequently indicate the seat of the ulcer. Examination of the posterior wall is difficult, but can be made through a slit in the omentum through which 2 fingers can be passed, invaginating the posterior wall. Should no ulcer be found in the stomach the duodenum should be carefully examined. Excision of the ulcer with suturing of its edges is advised. The cautery may be used if excision is impracticable. Robson does not approve of the ligation of the main arteries of the stomach as has been advised. Should the pylorus be found adherent gastroenterostomy is advisable. If, when the stomach is opened, no blood-vessel which can be ligated is found and the bleeding seems to be general, gastroenterostomy, by securing complete physiologic rest, would seem to offer the best chance for success. Robson recommends the posterior operation. The author reports briefly 5 cases operated upon for hematemesis with but 1 death.

W. L. Rodman [1] writes at some length upon **gastric ulcer** and presents a table of 40 cases treated by pylorectomy, partial gastrectomy, and excision. Ewald thinks that 5 % of the German population suffer with cancer of the stomach. DaCosta and Welch think it less common in America. Perforation and subphrenic abscess demand prompt surgical interference ; hemorrhage in many cases requires the same treatment ; while pain, vomiting, and other symptoms may be so marked as also to require surgical intervention. Rodman suggests that all cases of gastric

[1] Jour. Am. Med. Assoc., Dec. 1, 1900.

ulcer should be treated conjointly by the physician and the surgeon. The ulcer may be situated at any portion of the stomach, though more frequently found, according to Welch, on the lesser curvature and on the posterior wall. In about 1 out of every 5 cases multiple ulcers are found, rarely, however, numbering more than 2 or 3. The cause of ulcer of the stomach is not definitely known. Excess of hydrochloric acid is held by many to be an etiologic factor. Anemia is also looked upon as a cause. Rodman is not inclined to regard traumatism as a cause of the condition, saying that if injury produced the ulcer then the anterior wall should be its most frequent site, whereas it is shown that the posterior wall is usually the seat of the disease. The author seems to favor the anemic condition of the blood in considering the causative factors. The disease is most frequent between the ages of 20 and 60, and relatively more common between 40 and 60 than between 20 and 40. The most constant and reliable symptom is pain of a severe and boring character, situated 1 or 2 inches below the xiphoid cartilage and greatly increased by taking food, and which reaches its greatest intensity about 2 hours after eating. Tenderness on pressure is also a valuable symptom. The vomiting is hardly characteristic, excepting when there is found an excess of hydrochloric acid and when the pain which has been severe is suddenly relieved by the emptying of the stomach. Occasional hematemesis or melena would tend very strongly to confirm the diagnosis. In 1000 cases treated by von Leube hematemesis was present in 46%. Gerhardt found it in 47% of his cases, while Brinton met with the complication in only 29%. A large sudden hemorrhage will usually produce hematemesis, whereas in slow bleeding the blood may pass off by the bowel. Von Leube asserts that hemorrhage produces death in 8% of the cases in which it occurs. According to Welch, it causes death in 3% to 5% of all cases. The introduction of a stomach-tube is unnecessary in making a diagnosis and should not be employed. It is rare that a benign ulcer will produce sufficient adhesions to cause a palpable tumor. The majority of cases of gastric ulcer can be cured by medicinal treatment. Von Leube, who, the author tells us, is most optimistic, says that when ulcers are not cured in from 4 to 5 weeks of medicinal treatment, no hope of cure can be entertained by longer treatment. Kocher says that chronicity of gastric ulcer tends to carcinoma. The author discusses the question of excision of the ulcer and quotes the various authorities for and against this procedure. If the ulcer is situated at the pylorus and is readily accessible, pylorectomy is indicated, especially in persons past middle life and in old ulcers. Gastroenterostomy, however, is the operation which is most frequently indicated. Resection of multiple ulcers should not be undertaken, but gastroenterostomy should be performed. In but one case where the ulcer had produced adhesions to the anterior abdominal wall has the surgeon been able to separate these adhesions without tearing into the stomach. Rodman has the following to say regarding the treatment of hemorrhage from gastric ulcer: "(1) It would be highly injudicious, in my judgment, to

subject a patient to laparotomy during the first hemorrhage, even if the surgeon should see the case then, as he rarely will. The treatment of such cases should be absolute rest to the stomach, with astringents, opium, and, possibly best of all, high enemas, as advised and practised by Tripier. Here the treatment is entirely different from that of external hemorrhage; Dieulafoy, so far as I know, being the only one to advise operation during the first hemorrhage if so much as half a liter of blood is lost. (2) The surgeon has been called in to see a case that has had one severe hemorrhage, but which has probably ceased, and the patient is successfully rallying from shock. Here, too, I take it, 'a masterly inactivity' on the part of the surgeon will yield the best results. Only 8 % of those who bleed die; now, if we knew what percentage of this number die in or from the first hemorrhage, nonintervention would doubtless seem imperative. The free use of normal salt solution and other approved methods for combating shock should be the only thought of the surgeon at this time. A similar course is often pursued in external hemorrhage, dependence being placed on a firm clot which forms in the mouth of the bleeding vessel, usually preventing subsequent hemorrhage. Certainly a line of practice followed and justified in external hemorrhage is more than allowable here, as a serious operation—one with a mortality *per se*—must be performed if inaction is not to govern. (3) A patient has bled freely once, recovers, and in a few days bleeds seriously again; what should be the treatment? Inaction may be justified even in the face of a second hemorrhage, and, if I mistake not, the majority of those who have written upon the subject rather lean to, if they do not positively advise, this course. I cannot, however, do so, unless it be to await reaction and not operate in great shock. A careful study of my tables, in which there are tabulated 40 cases, will convince the hesitating that too great delay after the second hemorrhage is hazardous." Rodman places the mortality of operations for gastric hemorrhage at 37.5 % when only hemorrhage from gastric ulcer is considered. In hemorrhagic cases in which the ulcer is nonperforating and in which hemorrhage has ceased, pylorectomy, if the ulcer is at the pylorus, or partial gastrectomy, if the ulcer is situated elsewhere, is the ideal operation. Wherever multiple ulcers are found or suspected gastroenterostomy should be performed. Frequently it is impossible to find the bleeding-point. Savariaud reports 55 autopsies after sudden death from gastric hemorrhage and in 4 of them it was impossible after the most careful examination to locate the bleeding-point. The best results in operations for gastric hemorrhage occur in those cases where the hemorrhages have been small and frequently repeated. The author closes his discussion with a reference to the various means employed in treating the ulcer itself, such as excision, ligation, etc.

C. W. Mansell Moullin [1] reports 3 **cases of gastrotomy for gastric hemorrhage.** The first case is that of a woman 42 years of age, who suffered from recurrent hematemesis which took place at intervals of

[1] Lancet, Oct. 20, 1900.

about 6 months. The patient improved under medicinal treatment, but as soon as her diet was increased vomiting recommenced and the stools became black. When the stomach was opened 2 small ulcers were discovered on the posterior wall near the cardiac end. These were ligated by silk ligatures passed under them in two directions. The patient made an uneventful recovery, excepting that vomiting was troublesome for 10 days. The second patient was a woman 34 years of age, who vomited blood for the first time 4 days before admission. Since that time it had frequently recurred and the stools had become black. There was no history in this case of dyspepsia or of vomiting. The abdomen was not tender. The patient showed the effects of loss of blood. The day after admission the woman vomited 10 ounces of almost pure blood. When the stomach was opened one very small bleeding-point was found on the posterior wall near the pylorus. This point was not large enough to be called an ulcer. It was ligated with silk ligatures as in the previous case. The patient made a satisfactory recovery. Case 3 was a man 42 years of age, who 5 years previously had suffered apparently from a gastric ulcer. The patient had been free after this attack until 7 months before admission, when his former vomiting recommenced, with the addition of black stools and hematemesis. Considerable pain and tenderness were present in the epigastrium, but no tumor could be felt. The abdomen was opened to discover if the patient was suffering from a malignant growth. Nothing was found and the wound was closed. Upon recovering from the anesthetic the patient vomited blood, which continued through the night following. On the next day the abdomen was reopened, the stomach brought into the wound and opened. Through a vaginal speculum a large irregular surface 1½ inches in length was discovered at the cardiac end and from it blood was pouring freely. Strangulation of the surface by means of silk ligatures which had proved successful in two previous cases failed here because the silk cut through the tissue and only increased the bleeding. The operator then determined to ligate the whole thickness of the stomach-wall. This was done after invagination by the finger. Several Lembert sutures were introduced across the puckered spot on the serous surface and the stomach returned to the abdomen. The patient did well for 15 days, when in taking some chicken he became sick and 2 days later vomited blood, which was followed by severe collapse. Vomiting recurred 3 days later, but no blood was brought up. After this the patient made a successful convalescence. Moullin is inclined to think that the separation of the strangulated portion of the stomach-wall was responsible for the hematemesis which occurred a fortnight after the operation. It is urged that patients with gastric ulcer, and especially those in whom hematemesis occurs, should be turned over to the surgeon much earlier than has heretofore been the rule. "I must not be understood to suggest operation in cases in which the amount of blood lost is not sufficient to be serious or in which there has been only a single attack of hematemesis; but when the bleeding returns more than once and is either so profuse as to place life in immediate peril or so

continuous as to threaten a condition of dangerous anemia, operation, with the view not only of stopping the bleeding once for all, but of getting rid of the ulcer and of doing away with the possible risk of perforation, seems to me to offer a far better prospect than persistence in a form of treatment which has been tried and so far has not succeeded." The author refers to the number of cases reported of death of patients from gastric hemorrhage, no lesion having been found postmortem. One case occurred in the author's wards in which the patient died from postoperative hematemesis, and in which a careful examination postmortem revealed no lesion of any kind. In the second case reported Moullin doubts very much whether a lesion as small as this could have been found at a necropsy. In other cases in which postoperative bleeding takes place the author asserts his intention of opening the abdomen and endeavoring to control the hemorrhage.

G. H. Hume [1] presents a most instructive list of 11 cases of **perforated gastric ulcer** upon which he has operated. These cases comprise the author's experience with gastric ulcer. His table is so concise and so instructive that it is here reproduced:

TABLE OF 11 CASES OF PERFORATED GASTRIC ULCER OPERATED ON, WITH SIX RECOVERIES.

No.	Sex and Age.	Date of Operation.	Interval between Perforation and Operation.	Situation of Ulcer.	Treatment of Peritoneal Cavity.	Result.
1	F., 20	August 8, 1893.	48 hours.	Anterior wall near pylorus.	Flushed and drained.	Died.
2	F., 28	June 23, 1894.	Not stated in notes.	Not stated.	" "	"
3	F., 30	April 9, 1896.	48 hours.	Anterior wall near cardia.	" "	"
4	F., 23	Oct. 10, 1896.	5¼ "	Greater curvature.	" "	"
5	F., 16	Nov. 15, 1896.	11½ "	Lesser curvature.	" "	Recovered.
6	F., 18	Dec. 1, 1896.	43 "	Anterior wall.	" "	Died.
7	F., 19	April 9, 1898.	6 "	" "	" "	Recovered.
8	F., 18	August 19, 1898.	28 "	Greater curvature.	Wiped dry; no drainage.	"
9	F., 26	April 12, 1899.	21 "	Pylorus.	Sponged; no drainage.	"
10	F., 18	Nov. 5, 1899.	7½ "	Posterior wall, near lesser curve.	" "	"
11	F., 27	March 19, 1900.	7 "	Anterior at cardiac end.	Flushed and drained.	"

It will be observed that in the last 7 cases there occurred but 1 death. The first 4, operated upon between August, 1893, and October, 1896, died. In only 1 of these, however, was the operation an early one. The author had no difficulty in making the diagnosis except in case 9. In this instance the patient when seen had entirely recovered from the immediate collapse, and was operated upon later, after the commencement of peritonitis. Case 3 is an interesting one in that the patient's trouble seemed at first to be located in the right iliac region, there being both tenderness and rigidity in this neighborhood. An incision was first made in the appendix region, and revealing no lesion, another opening was made over the stomach. Hume says that a

[1] Lancet, Nov. 10, 1901.

history of stomach trouble, the sudden development of severe pain with collapse, epigastric tenderness and rigidity with a slight rise of temperature are sufficient symptoms to justify exploration. Vomiting was rare in the author's cases, and he considers its occurrence of evil import. In 3 of the cases the interval between perforation and operation was from 43 to 48 hours, and all the patients died. The author lost 1 patient operated upon 5½ hours after perforation, but this death he attributes to a general peritonitis, which he thinks can be accounted for by a large dose of castor oil which was administered before operation. One patient was saved by operation 28 hours after perforation, but here the stomach was absolutely empty and there was little extravasation of fluid into the general cavity. In the successful cases the interval after perforation ranged from 6 to 28 hours. In only one case was the ulcer found on the posterior wall of the stomach. In no case were the edges of the ulcer excised, the opening being closed in each instance by a double set of Lembert sutures. In addition a piece of omentum was laid over the site and fixed in this position. When there is only limited and local extravasation Hume thinks wiping better than flushing the peritoneal cavity.

Heydenreich [1] discusses the indications for **surgical intervention in gastric ulcer.** The first indication is perforation. This indication is absolute and must be responded to at once. The author does not recommend the excision of the ulcer. It is suggested that if the ulcer is so situated that it cannot be closed, or if the infiltration of the surrounding tissue is such that the sutures do not hold, the opening may be closed with omentum or with iodoform gauze. Pyloric constriction due to cicatricial contraction following ulcer also demands surgical intervention. Perigastric adhesions and accumulations of pus require surgical treatment. Surgical interference is not recommended in cases of severe gastric hemorrhage. In the small recurring hemorrhages which accompany gastric ulcer surgical treatment should be instituted. Excision of the ulcer is not advised, but pyloroplasty and gastroenterostomy are recommended. Heydenreich agrees with other writers in the belief that uncomplicated cases of gastric ulcer which have resisted methodic medicinal treatment should be submitted to operation.

Kronheimer [2] reports an interesting case of a woman 45 years old, who had for some time suffered from dyspeptic symptoms and was very anemic. Finally the patient developed a fixed pain in the left hypochondrium, and violent attacks of vomiting came on during which the pain was much aggravated. Five months before admission to the hospital a **swelling developed over the site of pain,** which finally ruptured. Dark fluid and pieces of food escaped from the opening. This was followed by great relief of the pain. So much of the stomach-contents passed through the fistula that the patient was able to get very little nutrition. When fluid was taken into the stomach it readily passed through the fistula. Hermes determined to operate with an idea of closing the fistula, but the patient took the anesthetic so badly that it

[1] Wien. med. Blätter, 43, 1900. [2] Deut. Zeit. f. Chir., Oct., 1899.

was thought wise to do only an enterostomy by means of which she could be nourished. The patient died 9 days after the operation from peritonitis, and it was found postmortem that the cause of the fistula was a large oval ulcer in the anterior wall of the stomach.

Musser and Wharton [1] report a case of **perforating ulcer of the stomach** occurring in a man aged 40. The patient had suffered from dyspepsia for many years. For 3 months previous to operation he had had considerable epigastric pain and had vomited occasionally, but never vomited blood. The pain was often relieved by taking food, so that the patient had developed the habit of always carrying crackers in his pocket. After drinking a glass of soda-water he was suddenly seized with severe pain in the epigastrium and fell to the floor in a faint. Wharton opened the abdomen 6½ hours after the onset of the attack and discovered a perforating ulcer on the posterior wall of the pyloric end of the stomach. Lembert sutures introduced with the idea of inverting the edges of the ulcer cut through the tissues, so that the operator was obliged to infold the wall of the stomach at some distance from the ulcer. The patient made a satisfactory recovery and returned to his home 4 weeks after operation.

In reporting cases of **perforated gastric ulcer,** Fred. D. Bird [2] includes a most interesting account of **perforating ulcer** in a girl aged 15. Sufficient symptoms were present to cause the operator to open the abdomen above the umbilicus, although there had been before operation some evidences of trouble in the lower portion of the cavity. The stomach and upper peritoneum were found perfectly normal. An incision was then made over the appendix region and a considerable quantity of foul material was evacuated. The patient died the day after operation, and necropsy showed that there had been a small perforation near the esophageal end of the stomach and that there was also another ulcer producing adhesion to the pancreas. In inquiring carefully into the patient's history it was learned that she had suffered 3 days previously with severe pain in the upper abdomen and had rejected everything that entered the stomach. Bird considers this latter symptom very characteristic of small perforations. It is quite evident in this case that the stomach-contents passed down over the omentum into the pelvic cavity, setting up peritonitis in this region.

R. C. B. Maunsell [3] presents **some practical points in the diagnosis and operative treatment of perforated gastric ulcer.** After discussing the statistics the author asserts that we are now able to save from 45% to 50% of patients who 7 years ago would probably all have died. Figures are quoted to show the great advantages of early operation. Four cases are reported, 2 in women and 2 in men. Attention is called to the fact that frequently cases present a double onset, the second onset being the result of a general diffusion of a localized extravasation. The points he wishes to draw special attention to are:

[1] Phila. Med. Jour., Feb. 16, 1901.
[2] Intercolonial Med. Jour. of Australia, Feb. 20, 1901.
[3] Brit. Med. Jour., Mar. 23, 1901.

"(1) The pain, which begins in the epigastrium, spreads, but does not shift its position. (2) There is no pain on micturition, which is a frequent sign in peritonitis of the lower abdomen. (3) Thirst is not intense, and there is no flinging about, as in hemorrhage. (4) There may be no distention in muscular subjects, the tympanites and free gas being only shown by the encroachment on the thoracic area. (5) The pulse cannot be relied upon in forming an early diagnosis. (6) The statement sometimes made that a 'stomach-note' excludes perforation is unwarrantable, as a perforated and a collapsed stomach are by no means synonymous terms. (7) Liver dullness is diminished or absent in almost every case." It is urged that every patient in whom perforation is suspected should be submitted to an exploratory incision. The operation should be undertaken at as early a period as possible. The author recommends the suture of a portion of omentum over the site of the closed perforation. He thinks that sponging with gauze pads is better than irrigation in cases of localized peritonitis following perforation. Unless there is a distinct abscess well walled off by adhesions, drainage is not required.

H. Brunton Angus [1] relates a case on which he **operated for gastric ulcer because of acute hematemesis.** The case is interesting because the patient, subsequent to operation, developed venous thrombosis in both lower extremities. The patient ultimately made a good recovery. It is not thought that the origin of these thromboses was septic, "(1) because constitutional disturbance was slight; (2) there was no pus formation; (3) they soon recovered and the vascular channels became reestablished."

J. F. Faur [2] calls attention to the fact that **pain in the interscapular region** near the midline is indicative of some intraabdominal lesion. The most frequent cause of this referred pain is the perforation of a gastric ulcer. Great stress is laid upon this symptom in doubtful cases of perforation.

In presenting a report of a number of cases of **gastric perforation** Charles Ryan [3] relates one which is particularly interesting from a diagnostic point of view. The patient was a woman 30 years old. On admission she presented marked abdominal rigidity, rapid and feeble pulse, and presented the appearance of being exceedingly ill. Palpation of the lower abdomen and vaginal examination revealed the presence of fluid in the pelvic cavity. A small opening was made above the pubes and a large quantity of dirty-looking serum with curds in it, but having no fecal odor, was evacuated. No lesion could be found to account for this condition in the pelvis or lower portion of the abdominal cavity. A second incision was made over the stomach and a perforation found in the anterior wall with fluid issuing through it. The ulcer was excised. The patient made a good recovery. Ryan thinks that a careful investigation of the patient's history might have led him to suspect a perforated gastric ulcer, but at the time of the operation she was

[1] Brit. Med. Jour., Mar. 23, 1901. [2] Semaine Méd., Jan. 23, 1900.
[3] Intercolonial Med. Jour. of Australia, Feb. 20, 1901.

in a desperate condition and demanded immediate operation. The condition found in the pelvis justified the making of the lower incision, which greatly facilitated the cleansing of the abdominal and pelvic cavities. The author has usually found profound collapse accompanying perforation. He had met with vomiting on one occasion only and considers it a serious symptom. Muscular rigidity and abolition of abdominal respiration are symptoms of the greatest importance. The absence of liver dullness is also of great importance. Reference is made to a case of perforated gastric ulcer which produced symptoms simulating those of ruptured extrauterine pregnancy.

B. G. A. Moynihan [1] discusses at some length **the surgery of chronic ulcer of the stomach** and presents a series of 11 cases upon which he has operated. In 2 instances pyloroplasty was performed; in 2 cases gastroplasty for hour-glass contraction; and in 1 case gastrolysis. All of the patients made satisfactory recoveries and were completely relieved of the conditions for which the operations were done.

DISEASES OF THE PERITONEUM AND INTESTINES.

In an article on **inguinal colostomy** W. J. Mayo [2] relates a case of multiple polypi of the rectum in which he performed a left inguinal colostomy with the result of greatly aggravating the patient's already deplorable condition, as the disease extended throughout the colon. As a result of this experience, he advises opening the exposed bowel in the inguinal region for the purpose of exploration. In two instances by this method he has found the disease extending to a point above the purposed site of the colostomy, thus rendering the intended operation useless. A few sutures safely close the exploratory incision in the bowel. [In one case we have had an experience identical with that of Mayo and cordially concur in his suggestion.]

C. P. B. Clubbe, [3] in a clinical lecture on **intussusception,** mentions his **statistics in the treatment** of this condition. Of 49 cases, 4 were reduced by injections alone. Of 45 operated upon, 24 patients recovered and 21 died, a mortality of 45.5%. In the successful cases the time elapsing from the onset of symptoms to operation averaged 24 hours, whereas in the fatal cases the average time was 56 hours. Of the different varieties there were 30 ileocecal, 5 ileocolic, 3 colic, 1 enteric, and 6 double—that is, ileum into ileum and this into cecum. Concerning injections, he says the child should always be prepared for operation and anesthetized. If, after injecting from 10 ounces to a pint of warm oil or water, the tumor persists, proceed at once to operation.

W. M. A. Anderson [4] reports a case of **foreign body in the rectum.** The patient complained of a prickling sensation. Digital examination disclosed a piece of galvanized wire lying transversely, the end embedded in mucous membrane. It was necessary to employ anesthesia and to incise the sphincter in order to dislodge the wire.

[1] Brit. Med. Jour., Dec. 8, 1900.
[2] Am. Med., Apr. 20, 1901.
[3] Brit. Med. Jour., Mar. 23, 1901.
[4] Brit. Med. Jour., Feb. 2, 1901.

E. W. H. Groves[1] publishes a case of **congenital intestinal stricture** in an infant 20 months old. There was no history of syphilis or tuberculosis. The baby was robust until it started to take solid food, when it began to lose flesh. On examination there was extreme emaciation and great distention of the abdomen. There had never been any vomiting and the bowels were regular. Laparotomy was rejected by the parents. At autopsy a hard stricture, ¾ inch broad, and barely admitting a probe, was found 39 inches from the cecum and 55 inches from the pylorus. Congenital stricture is recognized as of three varieties: (1) A diaphragmatic stricture composed of mucous membrane, submucous tissue, and circular muscle; (2) a regular contraction of the bowel involving all the coats; and (3) an entire obliteration of the bowel. The third is the commonest variety, and causes death within a few days of birth. As a disease associated with clinical manifestations apart from the new-born, any form of congenital stricture is extremely rare. Groves found one other case, a boy 8 years old, having a hard stricture 38 inches above the cecum. The theory of congenital stenosis is that it arises in connection with the involution of the embryonic vitelline duct, the involution extending to and involving the bowel, which together with the Meckel diverticulum is converted ultimately into a fibrous cord. There are cases on record in which a fibrous cord or polypus remains attached to the seat of stricture, tending to corroborate this theory.

P. R. Bolton,[2] in a paper on the **treatment of colitis by valvular colostomy and irrigation,** reaches the conclusion that even in favorable cases but a portion of the mucous membrane of the colon can be reached by injections through the anus, and that to insure contact of the medicated solution with the entire mucous membrane of the colon, fluid should be forced through from the cecum. He has operated on one case, in a male, aged 42, who had developed diarrhea, fever, and prostration 8 weeks before admittance to the hospital. Medicinal treatment but little influenced the diarrhea, the stools containing blood and mucus, persisting at from 16 to 23 per day. The rectum and sigmoid presented numerous superficial ulcerations. The patient had lost 31 pounds in weight. Bolton established a fistula in the cecum in the manner suggested by Kader for gastrostomy. The after-treatment consumed 4 weeks, and consisted of dieting and lavage of the colon. After inserting a large Kelly speculum through the anus, several quarts of 0.01% silver nitrate solution, and a quantity of salt solution following, were injected into the cecum and the colon thus irrigated. For 3 days this washing was done twice daily, then daily for 11 days, and on alternate days during the remaining time while under treatment. The patient entirely recovered.

H. Hartmann[3] proposes the following method of **colostomy.** He opens the abdomen by the McBurney intramuscular method and draws the sigmoid with a loop of the descending colon far out of the wound, the distal loop being tense, the proximal redundant. If the mesentery

[1] Brit. Med. Jour., Mar. 23, 1901. [2] Med. Rec., Mar. 16, 1900.
[3] Rev. de Chir., Nov., 1900.

is insufficient, he strips off the parietal peritoneum from the fossa and sews it over the gut posteriorly. The mesentery is now transfixed by a piece of iodoform gauze, and gauze is packed around the bowel in the wound. After 1 or 2 days an opening is burned through the longitudinal band just as it emerges from the upper part of the wound. It is claimed that the function of the anus is excellent, and that prolapse, contraction, absolute incontinence, and flowing of the feces into the lower loop are all avoided.

Morestin [1] reports the case of a woman aged 82, suffering from **intestinal obstruction from a gall-stone.** She was operated upon 5 days after the onset of symptoms. About 19 inches above the ileocecal valve a yellowish-white faceted gall-stone could be seen blocking the fecal current. It was extracted through a longitudinal incision, was as large as a big chestnut, and weighed over ¼ ounce. There was a fistulous communication between the gall-bladder and the duodenum, through which the calculus had passed. The gall-bladder contained 1 gall-stone. The patient died 3 hours after operation.

Biagi [2] reported before the Italian Surgical Society the results of **iodin injections for tuberculous peritonitis,** claiming to have cured 6 patients. He uses a sixth to a half grain of iodin in solution. There is pain, but no risk. During the discussion of these cases iodized milk made by adding pure iodin to milk and kept aseptic by a small quantity of chloroform was advised.

T. S. Kirk [3] publishes a case of **complete prolapse of the rectum successfully treated by intraabdominal fixation.** The patient was a child, aged 12 months. The protruding mass measured 4 inches in length, was much congested, and the mucous membrane was marked with a number of small ulcers. An oblique incision was made in the left iliac region and the abdominal cavity entered by the muscle-splitting method. After denuding the iliac fascia of peritoneum, the upper rectum was sutured to the exposed area by a fine silk suture run in an oval manner so as to bring a large area of bowel in contact with the fascia. The portion of the bowel so bound down was very close to the attachment of mesocolon, in order to prevent an aperture being left in which the intestine might later become strangulated. The child made a rapid and complete recovery.

Schmidt,[4] in a paper on **Meckel's diverticulum and ileus,** publishes a case of a girl aged 15 years, who suffered an attack of obstruction when 6 years old. During infancy there had been a discharge from the umbilicus. When seen by the author she had presented symptoms of incomplete obstruction for 4 weeks. A lumbricus had been discharged through the umbilicus. Schmidt excised the umbilicus and found a diverticulum running into a loop of empty intestine. This was ligated and some of the adherent loops of intestine liberated. The patient perished within 24 hours. At the autopsy the appendix was discovered to

[1] Bull. et Mém. de la Soc. Anat. de Paris, Feb., 1900.
[2] Gaz. degli Osped., Dec. 2, 1900. [3] Brit. Med. Jour., Dec. 22, 1900.
[4] Deut. Zeit. f. Chir., vol. LIV, Dec., 1899.

curl around an empty loop of intestine which included the diverticulum. The lower part of the loop was the cecal end of the ileum, the upper end was sharply kinked by the appendix which adhered to it behind. The small intestine was coiled between the diverticulum and the colon, causing obstruction of the root of the coil. The adhesion of the appendix, the author believes, was secondary and not the cause of obstruction.

Auvray [1] describes a case of **intussusception in an adult** male aged 29, successfully treated by disinvagination through an abdominal incision. The case was at first thought to be one of appendicitis. Reduction after 3 days was accomplished without difficulty, and no lesion could be found to account for the intussusception. Michaux reports 3 cases of intussusception occurring in adult females, the youngest of whom was 23 years, the oldest 56 years of age. He believes intussusception in adult life to be much more common than is generally conceded. He estimates that 55 % of the cases occur in children under 10 years of age, and 45 % in individuals above that age. The symptoms and the lesion itself are usually less severe the older the subject. Polypus or other nonmalignant growth is commonly observed in adults, but rarely found in children. The diagnosis is difficult, and the attempt to make it causes much perplexity, the symptoms seemingly pointing to ulcer ventriculi, appendicitis, renal colic, or pelvic inflammation, according to the site of the obstruction. Michaux urges early resort to operation. After opening the abdomen, one of four procedures may be adopted : the establishment of an artificial anus, simple disinvagination, resection of the whole of the involved gut, and resection of the intussusceptum. An artificial anus should be established only in case of a patient desperately ill. Disinvagination is rarely advisable because of the existence of adhesions. Resection of all the involved bowel is dangerous and difficult. He advocates resection of the intussusceptum as the most rational procedure at the present day.

R. De Bovis [2] analyzes 426 cases of **cancer of the large intestine.** It occurs 1 in every 2500 cases of illness, averages 1 for every 300 deaths in hospital statistics, is more frequent in males, is seldom encountered in childhood, and is most frequent between the ages of 40 and 60. Of 35 cases between the eleventh and thirtieth year, 23 were in females. The ileocecal region is a favorite site, and the cancer is usually annular. When lateral in situation, it favors intussusception. The annular variety may be scirrhous or colloid, generally, however, scirrhous, which causes stricture of the gut, with a resulting hypertrophic dilation above and an atrophy of the intestine below the constricted portion. This difference in the size of the caliber increases the difficulty of making an anastomosis after resecting the diseased area. With the progress of the disease adhesions are established to the environing structures, and pus-formation is likely to occur when the mucosa is involved, causing the vegetations so frequently found in the lumen of the bowel. If the suppuration extends, there may be perfor-

[1] Bull. et Mém. de la Soc. de Chir., Nov. 24, 1900. [2] Rev. de Chir., June, 1900.

ation of the gut-wall and death. The mesenteric lymph-nodes seldom become the seat of secondary growths. The liver is the most frequent situation for secondary deposits.

G. G. Davis [1] reports 3 cases of **peritonitis in typhoid fever** patients on whom he operated. One had a moderate degree of peritonitis, but no perforation was found. One was operated upon 10 hours after a perforation occurring on the fifth day of disease. Both of these patients recovered. The third patient died 36 hours after 2 perforations had been sutured. He believes patients with enteric fever bear operation much better than is generally supposed. [In a case in which one of us (DaCosta) operated, the perforation was not found, but at the necropsy it was discovered in the hepatic flexure of the colon.]

R. Hamilton Russell [2] describes a remarkable **congenital malposition of the intestines.** The patient was a boy aged 11, who had suffered

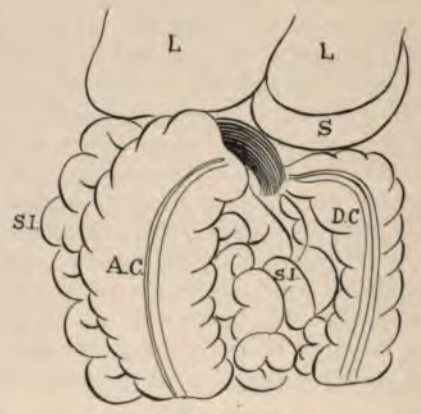


Fig. 21.—L., liver; S., stomach; S.I., small intestine; A.C., ascending colon; D.C., descending colon; the dense constricting band passing over the transverse colon as the stretched mesentery of the small intestine with the commencement of the jejunum (R. Hamilton Russell, in Intercolonial Med. Jour., Mar. 20, 1901).

several attacks of partial intestinal obstruction. He succumbed to one of these attacks and was subjected to autopsy. The stomach and duodenum were normally placed, but the first portion of the jejunum, together with the whole thickness of the mesentery, took a sharp turn upward to the right, passing first in front of the transverse colon, then arching over the top of that viscus and descending behind it. The entire small intestine was carried by the mesentery so as to lie behind the ascending colon. The author believes the malposition was associated with the developmental migration of the cecum, the large bowel in some mysterious way getting behind the mesentery and internal to the small intestines. He refers to a case very much like his own,

[1] Am. Jour. of Surg. and Gynec., Sept., 1900.
[2] Intercolonial Med. Jour., Mar. 20, 1901.

reported by Dr. Florence Boyd in the "Lancet," vol. II, p. 1131, 1892.

Terrier and Gasset [1] review 52 cases of **exclusion of the intestine,** and conclude that total exclusion with total occlusion should be rejected, that exclusion with partial occlusion of the excluded part is more desirable in intestinal tuberculosis and fecal fistula, and that time must decide whether or not unilateral exclusion is advisable in inoperable bowel cancer, and how dangerous the reflux of the intestinal contents into the excluded part really is.

Chaput,[2] at the Société de Chirurgie de Paris, December 12, 1900, related a case in which a **gauze compress was retained in the peritoneal cavity** for 7 years. The patient had undergone an operation for ectopic pregnancy, during the course of which gauze tamponage for hemorrhage became necessary. Seven years later Chaput undertook to close a fecal fistula in the old incision. The sinus led down to a mass simulating a new-growth of the intestine which was in reality an encysted piece of gauze about 52 centimeters square. Recovery followed.

G. A. Syme records a case of **carcinoma of the cecum and ascending colon with intussusception.** A woman aged 34 had noticed a growth in the right iliac region for 6 months. There were occasional pain, nausea, and vomiting. The bowels were regular. She had emaciated considerably. The growth was removed and the ileum implanted into the colon in the following manner: A longitudinal incision was made in the colon corresponding in length to the diameter of the ileum. The cut end of the ileum was fixed by 2 sutures to the ends of this incision and then invaginated and protruded through the cut end of the colon, as in the Maunsell method. The ileum was sutured to the edges of the longitudinal incision in the colon and then drawn back. The divided end of the colon was closed by a continuous silk suture. An examination of the specimen showed that the greater part of the wall of the cecum and a portion of the ascending colon were involved and were intussuscepted into the colon. The patient recovered.

Carl Beck,[4] in a paper read before the Chicago Medical Society, October 10, 1900, reports 2 cases of **sponges left in the abdominal cavity.** In one the sponge caused an abscess which opened into the incision. In the other, it was discharged through the bowel. He cites 3 typical cases of silk ligatures sloughing into the bowel, the bladder, and the uterine cavity. Such cases may puzzle the operator, as a number of the most perplexing symptoms obscure the diagnosis. Serious consequences may follow the sloughing of sutures into hollow organs, but, as a rule, there is only a tedious, protracted ailment of an indefinite character. Hemorrhage from the intestine is a characteristic sign and led the author to suspect in one case a forgotten sponge. His conclusions are: (1) Silk ligatures are not so harmless as they are usually regarded. (2) Absorbable material should be preferred. (3) If unab-

[1] Rev. de Chir., Dec. 10, 1900.
[2] Med. News, Feb. 16, 1901.
[3] Intercolonial Med. Jour., Sept. 20, 1900.
[4] Chicago Med. Recorder, Nov., 1900.

sorbable material is used, small and interrupted sutures should be employed. (4) It takes less time for the interrupted sutures to slough out. (5) A route for egress should be prepared if ligature suppuration is suspected. (6) Even catgut may cause such symptoms.

Wunderlich [1] reports 2 cases of **gauze pads left in the abdomen** after celiotomy. One was in a patient who had promptly recovered from operation for a large ovarian cyst. Four months later a profuse diarrhea, resisting all treatment, set in. Finally a piece of gauze about 6 by 24 inches was passed by the anus and the diarrhea ceased. The second case was one of cholecystectomy for chronic cholecystitis. Thirty-six hours after operation the patient suddenly expired from heart-failure. At the necropsy a large gauze pad was discovered in the peritoneal cavity.

F. Marsh [2] exhibited before the Birmingham and Midland Branch of the British Medical Association, a **wool swab** which had been **encysted in the peritoneal cavity** for 17 months. The patient had been subjected to an exploratory laparotomy for symptoms referable to the gall-bladder, adhesions only being found. No relief was afforded, and after a few months the pain became constant, vomiting more frequent, and the bowels very irregular. Finally, a hard, rounded mass was palpated in the region of the gall-bladder. An incision proved this to be a wool-swab surrounded by pus. The man made a good recovery and is now free from pain.

C. G. Cumston [3] reports a case of **cholecystectomy and resection of the liver for carcinoma.** The patient was a man aged 49, who had been subjected to cholecystotomy 9 months before for calculi. Palpation revealed a mass in the region of the gall-bladder, and the liver dullness was increased about one finger-breadth below the costal margin. Through an incision along the external border of the rectus the gall-bladder which was adherent to the under surface of the liver, duodenum, omentum, and abdominal wall was excised. The area of liver to which the gall-bladder adhered, together with a secondary nodule about the size of a 25-cent piece situated on the right lobe of the liver, was resected by the Paquelin thermocautery. A large vein in the parenchyma of the right lobe bled very freely and was secured by a suture ligature. The large cavity was packed with gauze. Convalescence was uninterrupted. Cumston reviews the cases of resection of the liver and gall-bladder and reports other surgical cases.

R. Abbe [4] reported to the Practitioners' Society, February 1, 1901, a case of **universal peritonitis** following **ruptured duodenal ulcer** operated upon 27 hours after perforation, and followed by recovery. The patient was a young man, who while apparently in perfect health was seized with intense abdominal pain, rapidly followed by symptoms of general peritonitis. The diagnosis seemed to lie between perforated gastric ulcer and appendicitis. A median incision below the umbilicus disclosed the fact that the pelvis was filled with yellow pus. The appendix, absolutely solid and distended with lymphoid tissue (the only specimen of

[1] Münch. med. Woch., July 10, 1900.
[2] Birmingh. Med. Rev., Mar., 1901.
[3] Med. News, Feb 16, 1901.
[4] Med. Rec., Mar. 2, 1901.

this kind Dr. Abbe had ever seen), was excised through a small lateral incision. As the cause of trouble had not been found, a third incision was made in the median line above the umbilicus. The omentum was crowded up against the half-empty transverse colon. When the colon was drawn down, a quantity of foul matter was seen coming from below the stomach, and this filled the space between the liver and stomach. The liver was coated with lymph and separated from the diaphragm by a space of air. The entire abdominal contents showed evidence of infection. About 1¼ inches below the pylorus a rupture of the duodenum was found; it was about the size of a lead-pencil and was freely discharging gas and mucus. It was surrounded by a double row of purse-string sutures. The peritoneal cavity was then cleansed and irrigated, and a tube left in the upper and one in the lower incision. The patient made an uneventful recovery. Dr. Abbe said that in a recent paper on this subject, by Dr. Robert F. Weir, there was a report of 51 cases of perforating duodenal ulcer which had been operated on, with 7 recoveries. In 25 of the 51 cases the ulcer was found and closed; in the remaining cases it was not found at the time of operation, and all the patients died. Of the 7 recoveries, all were operated on within 30 hours—most of them within 6 hours. The most striking symptom in the majority of these cases was the very sudden onset of the pain; it was violent and instantaneous, coming on without premonitory symptoms, while the patient was walking or straining, or upon making a false step. In most of the cases vomiting was a prominent symptom. The symptoms progressed rapidly to a fatal termination. If an operation was done within the first 6 hours, about 25% could be saved.

J. C. Pegram [1] reports 2 cases of **perforating duodenal ulcer with subphrenic abscess.** Case 1 was diagnosticated intestinal strangulation. Operation disclosed a perforated duodenal ulcer admitting the end of the forefinger, and lying on the anterior wall near the pylorus. There was a subphrenic abscess holding at least 2 quarts of fluid. No attempt was made to close the ulcer, but instead it was walled off with gauze. The man died 36 hours later of general peritonitis. The second case, fatal without operation, presented the symptoms of perforative peritonitis. An opening about 1 centimeter in diameter occupied the upper anterior part of the duodenum, almost touching the pyloric orifice. Between the liver and diaphragm was a thick purulent collection.

Edmondo Berger [2] records a case of **subphrenic echinococcus cyst.** In the left hypochondrium was a large tumor moving with respiration and pulsating with each contraction of the heart. Diagnosis was made by puncture. Operation was followed by recovery.

At a meeting of the Société Médicale des Hôpitaux de Paris, July 13, 1900, Edgard Hirtz and M. O. Josue [3] read a paper on **gangrene of the intestine from portal thrombosis.** The symptoms are not definite enough to permit an antemortem diagnosis. Paroxysmal pain is a constant symptom. Barth had a case in which the pain was so

[1] Boston M. and S. Jour., Dec. 27, 1900. [2] Gl. Incurabili, Aug. 1–15, 1900.
[3] Lancet, Oct. 6, 1900.

violent that hepatic colic was diagnosticated. Pain occurring in the course of ascites or not conforming to any recognized type should make one consider portal thrombosis. The condition may be confounded with intestinal obstruction. The case of a woman aged 33 years is cited. She noticed enlargement of the abdomen coming on acutely. About the ninth day pain developed. There was diarrhea, but no blood in the stools. At the end of 3 weeks collateral venous circulation was developed in the abdominal wall. She died on the twenty-fifth day. At autopsy much ascites was found. At its middle, for a distance of 20 inches, the small intestine was red, thickened, and contained fluid blood. The portal vein was completely occluded by clot. The liver was nutmeg in appearance.

George Dock [1] calls attention to the **hot bath as an aid in abdominal diagnosis,** a method but little employed since the advent of anesthesia. Dock maintains that the same results may be obtained as after general anesthesia; indeed, the patient can often aid the examiner, when necessary, by contracting the diaphragm. The patient is placed in water at 100° F. and the temperature gradually raised to 110° F. Relaxation is often complete in 5 to 10 minutes; sometimes, however, it is necessary to raise the temperature to 120° F. Two illustrative cases are cited. In one patient a diagnosis of abdominal tumors was readily dispelled, the masses being prominent recti muscles. In a second case the appendix was easily palpated in the bath and an obscure condition solved.

C. Tarchetti [2] concludes that **enlargement of the supraclavicular lymph-glands** is infrequent in abdominal carcinoma, but should be looked for in doubtful cases. [It should be looked for not only to aid the diagnosis of doubtful cases, but in every case even when the diagnosis is clear, because if it exists, radical operation on the intra-abdominal growth is out of the question.]

J. C. Webster [3] believes that **intraabdominal displacements** cause many of the symptoms which are frequently classed as neurotic or credited to reflex lesions from the pelvic organs. He calls attention specially to **separation of the recti,** believing general weakness of the abdominal wall and pendulous abdomen to be due to this condition. The most important etiologic factor is pregnancy; in fact, most women present some separation of these muscles in the latter months of gestation. A strain or fall may inaugurate the condition, and the wearing of corsets is a predisposing cause. Splanchnoptosis is sure to result. Movable right kidney is the lesion most found, sometimes with sagging of the stomach and transverse colon. Relaxation of the pelvic floor with uterine retrodisplacement is often seen. The symptoms are variable—dyspepsia, weak back, constipation, and pains in the iliac, lumbar, and other regions. The diagnosis is made by feeling the separation. The extent of separation is readily discerned by asking the patient to

[1] Western Med. Rev.
[2] Deut. Arch. f. klin. Med., Leipzig, 1900, Bd. XLVII, 5 and 6, No. 3, 575.
[3] Jour. Am. Med. Assoc., Dec. 22, 1900.

raise the head and shoulders when lying on the back. Abandonment of corsets with suspension of the skirts from the shoulders gives relief in mild cases. An abdominal binder with massage is beneficial. Extreme cases should be subjected to operation. Webster sutures the recti together with strong linen, which is allowed to remain permanently. The author has performed 51 operations of this character since 1898. In 55 % of the cases it was necessary to remedy a uterine prolapse as well. Some of the cases required nephrorrhaphy also. If enteroptosis is marked, an elastic binder should be worn for 6 or 8 months following the operation.

In concluding a paper entitled "A Plea for **Enterostomy in Acute Intestinal Obstruction,**" read before the Chicago Surgical Society, January 9, 1901, Emanuel J. Senn [1] advocates in selected cases the operation as first practised by Nelaton in 1840 especially when facilities are not favorable for a laparotomy, and when the patient's condition does not warrant such an operation. It requires but ordinary skill, while radical treatment is critical. The opening in the intestine should not exceed ½ inch in length, parallel with the axis of the bowel, thereby readily closing after its purpose has been fulfilled. If obstruction persists, radical operation may be performed later, when the acute symptoms have subsided.

T. L. McArthur [2] writes on **ileus due to vascular obstruction,** embolic and thrombotic. As vegetations, syphilis, endarteritis, etc., produce obstruction in the brain and other organs, so they may cause occlusion of the mesenteric vessels. Embolus lodging in one of the mesenteric arteries is rare, but is occasionally seen and causes gangrene of the bowel, as there is no collateral circulation. An endarteritis, syphilitic or otherwise, a bullet-wound, surgical trauma, a near-lying strongylus, or aneurysm may cause death of the bowel-wall by inducing thrombosis. Thrombosis of the mesenteric veins is usually due to an infective phlebitis originating in the intestinal mucosa. Hematemesis and melena more frequently occur in venous obstruction, as do exudation and infection from intestinal bacteria. When the arterial supply is cut off, death of all the coats is so sudden that there is not time to throw out lymph, the bowel therefore presenting a smooth, black, slimy appearance. On the other hand, the bowel is reddish-black, roughened, with more or less exudate when the venous channels are occluded. It is of vital importance to resect well above the apparently gangrenous loop. The most constant symptoms are: Blood seen either in the washings from the bowel, in the bowel movements, or in the vomitus, unaccompanied by the tumor of intussusception; colicky pains associated with pains in the back and lumbar region; early collapse if the embolism has been sudden or extensive; and cardiac disturbance, arrhythmia, great frequency of pulse, and albuminuria. McArthur reports a case in which the whole of the small intestine was gangrenous, as well as the ascending and transverse colon.

In a paper on the prevention and relief of **postoperative intesti-**

[1] Chicago Med. Recorder, Feb., 1901. [2] Ann. of Surg., Apr., 1901.

nal obstruction, Clement Cleveland [1] calls attention to the measures of preventing the excessive intestinal handling, which is such an important factor in the production of intraabdominal adhesions and obstruction. The restricted diet, laxatives, and enemas administered before operation aid much in making the intestines docile during operation. During the operation the Trendelenburg posture is invaluable, carrying, as it does, the intestines out of harm's way. Cleveland advises covering the intestines with omentum and then gently forcing them still farther into the upper abdominal cavity by wet gauze pads. Every stump or particle of raw tissue should be cauterized or covered with peritoneum. The leaving in of salt solution lessens the amount of plastic lymph thrown out, and thus lessens the amount of adhesions. In the treatment of obstruction the employment of oxygen gas insufflation is highly extolled. Five cases are reported to illustrate its value. It is introduced slowly through a water-bottle, and discontinued as soon as there is decided pain and feeling of increased distention. Cleveland believes that it not only straightens out the intestines, but also acts as a stimulant to peristalsis.

The sudden appearance of abdominal tumors should suggest to the observer a lesion that demands intervention; for nearly, if not all, are curable only by surgical means, which in most instances must be prompt. Maurice H. Richardson [2] reports 7 cases of nontraumatic **tumors of the lower abdomen suddenly appearing** where none had previously been detected, and makes some remarks on this condition. Two were ovarian tumors with twisted pedicles, 1 a thin-walled ovarian cyst, distended by a fluid composed mostly of blood, 1 a pelvic abscess from appendicitis, 1 an acute dilation of the stomach, the viscus containin. several gallons of fluid, and 2 were idiopathic dilations of the sigmoid flexure. The most common of the suddenly appearing tumors, and the ong most likely to be overlooked, is the overdistended urinary bladder. The ordinary phantom tumor can hardly be called suddenly appearing; it ie a well-known and persistent tumor, disappearing only under anesthesias The common forms of intussusception, volvulus, and simple obstruction need not be considered, as they are almost invariably small and hard to detect. In some instances, in explorations of suddenly appearing tumors, comparatively large collections of clear fluid will be found in close connection with such lesions as salpingitis and even appendicitis. An extreme development of these collections explains the large pseudocysts. The most common tumor which suddenly attains considerable dimensions is the ovarian tumor with twisted pedicle. More frequently the tumor is due to rupture of blood-vessels, and hemorrhage into the distensible cyst, without any twist in the pedicle. Pelvic hematoma and hematocele should be thought of especially when there is faintness and collapse. Among the remotely possible sources of suddenly appearing pelvic tumors are the distended gall-bladder and the intermittent hydronephrosis.

J. T. Williams [3] puts on record a **pseudocyst of the abdomen**

[1] Med. Rec., Jan. 5, 1901. [2] Boston M. and S. Jour., Oct. 4, 1901.
[3] Brit. Med. Jour., Feb. 2, 1901.

probably originating in a thrombosis of one of the veins of the gastro-splenic omentum, as a piece of fatty tissue about the size of 2 fingers was found in the cavity which occupied the epigastric region. The patient recovered.

Max Einhorn [1] has observed 42 cases of **apparent tumor in the upper abdomen** out of 6045 cases. He thinks they may be accounted for by the following conditions: Prolapse of the left lobe of the liver; exposure and thickening of the abdominal aorta; hypertrophy of the abdominal muscles; and adhesions around the lesser curvature of the stomach. There were no autopsies to confirm these impressions. Such apparent tumors may entirely disappear at times, are usually smooth, and often associated with enteroptosis.

At a meeting of the Midland Medical Society, January 16, 1901, Mr. Lucas [2] showed **6 feet of gangrenous intestine** due to a **strangulation through a mesenteric hole.** The patient had been feeling unwell for 5 days, and the day preceding operation he felt something suddenly give way in his abdomen. He presented all the signs of acute strangulation. The gangrenous intestine was excised and an end-to-end anastomosis made with the Murphy button. On the second day after operation he suddenly collapsed and died, owing to leakage at the point of anastomosis.

T. Myles [3] read a paper on **removal of large sections of intestine** in man and animals before the Royal Academy of Medicine in Ireland, December 7, 1900. He analyzed 33 cases in which over 3 feet had been removed in man, and concludes that when less than 6 feet 6½ inches are removed, subsequent symptoms are absent, but when more than this length is taken they are sure to arise. Children seem to bear these extensive removals better than adults. He cites the case of a boy, aged 10 years, from whom he removed 8 feet 4½ inches following **abdominal contusion.** At present he has an abnormally large appetite and suffers from looseness of the bowels.

Lindsay Peters [4] reports a case Kelly **operated upon for a pendulous fat abdomen.** Both breasts had previously been amputated because of the unbearable discomfort they produced; they weighed 25 pounds each. The patient weighed 285 pounds, the greatest circumference of the abdomen was 200 centimeters, and in the sitting posture the abdominal fold reached nearly to the knees. A wedge-shaped mass of skin and fat weighing 7450 grams was excised. The patient was discharged in good health.

Bullitt [5] reports a case of **pendulous abdomen** in which he removed a large portion of the skin and subcuticular fat during the course of an operation for umbilical hernia.

Frank Martin [6] reports a case of **recovery after abdominal section for multiple gunshot wounds of the abdomen.** The patient was a man, aged 24 years, who had received 2 bullet wounds of the

[1] Med. Rec., Nov. 24, 1900.
[2] Birmingh. Med. Rev., Feb., 1901.
[3] Med. News, Mar. 16, 1901.
[4] Ann. of Surg., Mar., 1901.
[5] Ann. of Surg., Nov., 1900.
[6] Ann. of Surg., Mar., 1901.

abdomen. At the operation, 21 hours later, perforations of the liver, gall-bladder, hepatic flexure of the colon, 2 of the small intestines, 1 of the rectum, with active and excessive hemorrhage, were found. The opening in the rectum was packed with gauze, hemorrhage from the liver checked with gauze tamponage, and the other perforations sutured.

Wm. N. Sullivan [1] reports a **cure of amebic dysentery by colostomy and irrigations.** The character of amebic ulceration, with its sinuous tracts and undermined edges, especially when situated at a distance from the rectum in the ascending colon or cecum, renders the application of solutions difficult or impossible when indirect methods are employed. A soldier, aged 35, contracted diarrhea in the Philippines. He was treated by various methods for 28 months without benefit. When seen by the author he was in a deplorable condition, extremely emaciated, weak, and having from 8 to 20 passages a day. Dr. Barbat established an opening in the cecum, and the colon was thereafter daily flushed with a gallon of sterile water containing a half pint of pyrozon. Following operation the temperature became normal, the agonizing pain ceased, appetite returned, and he began to gain in weight. Ameba coli, which was found in large numbers before operation, disappeared.

Fig. 22.—Wyeth's colostomy for permanent fecal fistula (Wyeth, in Jour. Am. Med. Assoc., Dec. 8, 1900).

At the meeting of the American Medical Association, June, 1900, John A. Wyeth [2] demonstrates a method of **colostomy for permanent fecal fistula.** Its chief feature is the formation of a considerable loop of the colon above the artificial anus, making an artificial sigmoid capable of holding a large amount of feces, which may be discharged at long intervals. After incising the abdominal wall, the large intestine is drawn through the wound, strong traction being made on the rectal side. About 4 inches of each leg of the loop should be exposed and united by 2 parallel rows of sutures, 1 on either side of the mesocolon. The loop is dropped back and held in position by a glass rod through the mesocolon or by sutures, every third suture including the skin. The bowel is opened after adhesions have formed.

Howard Lilienthal [3] reports a case of **hyperplastic colitis treated by extirpation of the entire colon.** Medicinal treatment failed to relieve the patient, a girl aged 21. A left inguinal colostomy was performed by another surgeon to give rest to the rectum. The colic walls

[1] Jour. Am. Med. Assoc., Dec. 8, 1900. [2] Jour. Am. Med. Assoc., Dec. 8, 1900.
[3] Am. Med., Apr. 27, 1901.

were covered with polypoid growths, which bled on gentle manipulation. The symptoms improved and the artificial anus was closed. Later, the patient's condition became as bad as ever, and Lilienthal made an artificial anus on the right side and irrigated the colon, without much improvement of the mucous membrane, but with great betterment to the patient's general condition. About 2 months later the ileum was joined to the sigmoid by a Murphy button, which was passed 13 days after operation, and the iliac and sigmoid openings of the excluded intestine were invaginated. The patient improved, but the stools were still frequent. About 3½ months later the entire colon was removed because of the annoyance of the fistula in the right inguinal region. The patient passed successfully through postoperative pneumonia. On the fourth day a fecal discharge from the right iliac wound developed. On the twelfth day a fistula developed at the left iliac wound and a piece of gangrenous mesocolon was discharged. Later, an operation to close the fecal fistula on the right side was performed, and the end of a portion of intestine, not a loop, passed directly into the fistula; this was invaginated. The patient was exhibited some 6 months after the colectomy in excellent health, and was then having 2 stools a day.

Charles L. Scudder [1] read before the Surgical Society of the Buffalo Academy of Medicine, April 2, 1901, a highly important paper on **contusions of the abdomen.** He says usually the physician is first summoned instead of the surgeon because there is no external wound, and on him rests grave responsibility, for the mortality in these cases is deplorably great. Many cases are fatal if left to themselves and the physician. Surgical intervention, to be successful, must be early, perhaps before a diagnosis is completely made. The evidence presented in literature has been carefully studied, and the following observations set forth: *Injuries to the Ureter:* Ruptures of the kidney or its pelvis have been improperly reported as ruptures of the ureter. Of the 23 recorded cases, 12 may be classified as injuries to the ureter proper. Of these 12, 5 presented contracted ureters associated with hydronephrosis following trauma. Five were probably ruptures, and 2—those of Poland and Mackenzie—proved without any doubt to be ureteral rupture. It is characteristic of injuries to the ureters that the symptoms which will assist in localizing the lesion are often delayed in appearing. The delay in some cases may be due to the fact that the injury to the ureter is primarily a bruising, which subsequently ruptures because of necrosis of the ureteral wall. Shock may be present and subside in a few hours, but no grave symptoms will appear unless an abdominal viscus be involved. Slight and intermittent hematuria, with persistent pain in the side and tenderness over the ureter, is strongly suggestive of ureteral rupture. A retroperitoneal tumor of blood and urine will form after several days if the ureter be torn across. It is impossible to distinguish between a ruptured pelvis of the kidney and a ruptured ureter. Wounds of the ureter have little tendency to spontaneous repair. Complete obstruction causes atrophy of the kidney, par-

[1] Boston M. and S. Jour., May 2, 1901.

tial obliteration will produce renal abscess, pyonephrosis, hydronephrosis, or cystic kidney. If the ureter alone is involved, there is no special danger to life, and immediate suture is the ideal treatment. Incision is indicated after infection has occurred. Nephrectomy should be a secondary operation. *Rupture of the Urinary Bladder:* The mortality is high. In uncomplicated cases, which are rare, the rent occurs at the upper and posterior part of the bladder in a vertical direction if the rupture is intraperitoneal. At times there may be a delay in the appearance of symptoms until necrosis completes a partial rupture. The symptoms are pain, a feeling of something having given way, difficulty in standing, shock, nausea, rectal tenesmus, temporary relief followed by a more urgent desire but inability to pass water, catheterization revealing bloody urine or nothing at all. Cases have been recorded in which clear urine has been withdrawn and yet the bladder has been ruptured. In extraperitoneal ruptures peritonitis does not appear unless the peritoneum has been injured by the trauma or becomes involved secondarily from extravasation of urine. Unilateral hypogastric tenderness and tumor suggest extraperitoneal rupture. The injection of air or of boracic solution into the bladder is a reliable test. Extraperitoneal wounds should not be sutured, the treatment consisting of cleansing and drainage. Close the intraperitoneal wound and drain the bladder. *Rupture of the Liver:* Of 543 cases of injury to the liver, more than one-half died within 24 hours from hemorrhage. Usually the right lobe is torn upon its convex surface, and in an anteroposterior direction. Jaundice is rare before the second day. The treatment consists of suturing, tamponing, or cauterization. *Contusions of the kidney* are followed by hemorrhage within the capsule; if the capsule be torn, hemorrhage will occur into the perinephritic fat, forming a pseudo-hydro-hematonephrosis; and if the peritoneum be torn, blood and urine may accumulate within the abdominal cavity. Of 189 cases of subcutaneous injury to the kidney, hematuria was absent in only 10 cases, due to a ureteral clot, thrombosis of the renal vessels, and a stricture of the ureter. Newman had a case of hematuria following a blow upon the loin in which the blood came from a preexisting papilloma of the bladder. Hematuria is of diagnostic value only; it is no criterion as to the amount of actual hemorrhage. It may appear after several days. Anuria may follow an injury to one kidney. Renal pain is usually constant and severe. Hemorrhage and sepsis are the dangers. In mild cases recovery occurs under expectant treatment. In grave cases patients do not recover without operation. If evidences of severe internal hemorrhage present themselves, exploration and probably nephrectomy will be necessary. Primary nephrectomy is much safer than secondary nephrectomy during sepsis. Partial nephrectomy, however, is to be seriously entertained, as demonstrated by the case of Keetley and by Bardenheuer, each of whom resected one-third of the kidney, with a successful outcome. Before nephrectomy, make sure by palpation of the existence of a second kidney. If it is found necessary to pack the wound, remember that there are several cases recorded in which the colon has been so compressed by packing as to cause obstruction.

Injury to the Stomach: The anterior wall is the most frequent site for rupture. An incomplete laceration of the mucous coat is not uncommon. In 6 out of 11 cases hematemesis was especially mentioned. In one case in which this symptom was absent there was a complete rupture near the pylorus. *Rupture of the Intestines:* Of 80 cases analyzed, 36 were from horse kicks, 23 from carriage-wheel accidents, 13 from man kicks, and 8 from spent shells; 75% are in the small bowel. If the rupture is caused by a crush, the wound in the peritoneum is smaller than that in the inner coats; if caused by bursting, the wound in the peritoneum is larger. Be sure the peritoneum covering all the lacerated muscular and mucous coats is reinforced. Rupture is usually caused by a crush of the bowel against the lumbar spine, and the wounded bowel commonly lies beneath the seat of contusion in the abdominal wall. Often more than one rent is found. Perforation may be delayed 5 or 10 days until a contused area has necrosed. Wounds of the duodenum and jejunum are less fatal than those of the lower ileum and colon, because bacterial flora are more scanty in the former situation. Shock is usually slight. Persistent pain and tenderness and early vomiting should lead one to operate. *Laceration of the spleen* is manifested by signs of internal hemorrhage, with greater dullness in the splenic region. This dullness does not vary as the individual is turned, splenic blood coagulating rapidly from the large proportion of colorless corpuscles it contains. Splenectomy is usually the best operation. If the spleen is large and extensively adherent, and the tear favorably situated, suture may be chosen. If the capsule is thin, the spleen soft, and the tear inaccessible, packing may be considered. Of 26 splenectomies, 12 proved fatal. Of 2 packed, 1 patient recovered. One case was sutured and resulted fatally. *Injuries to the pancreas* are unrecognizable. Shock and internal hemorrhage following epigastric trauma are presumptive evidences of pancreatic lesion. Of 9 fatal cases, in 2 only was the pancreas alone involved. Seventeen traumatic pancreatic cysts are recorded. It is very likely that many of these cysts are accumulations of blood and pancreatic secretion in the lesser omental cavity. Drainage is the treatment commonly employed in these cysts. There have been recorded several instances of unusual injury following contusion of the abdomen, notably rupture of the aorta, of the celiac axis, of the mesenteric vessels, of the spermatic artery, of the inferior vena cava, of the portal vein, of the gastroduodenalis artery, and of the gall-bladder. Rupture of the rectus abdominalis muscle is reported with fatal hemorrhage from a torn deep epigastric artery. Rupture of the diaphragm from external injury is recorded in but 3 instances. Finally, death has followed a blow upon the abdomen, with no discoverable pathologic lesions in the abdominal cavity.

G. T. Vaughan [1] reports 6 cases of **contusion of the abdomen,** all of which were fatal. Three were operated upon. Case 1: A sailor, aged 51 years, was struck on the abdomen by a revolving capstan bar. He died in 30 hours from general peritonitis. At necropsy, an opening

[1] Va. Med. Semi-month., July 13, 1900.

12 millimeters in diameter was found in the jejunum, $1\frac{1}{5}$ meters from the pylorus. Case 2: A brakeman, aged 23, was caught between the bumpers of two cars. The skin was intact, but the rectus muscle was ruptured. At the operation, 9 hours later, the sigmoid flexure was found to be completely divided; a portion of small intestine was so disorganized as to require the resection of 6 inches; the superior mesenteric artery was found divided 4 or 5 inches from its origin, and the great omentum was so lacerated as to necessitate a resection of the greater portion of it. Both intestinal anastomoses were accomplished by Murphy buttons. Death occurred 30 hours after operation, from peritonitis and anemia. Case 3: A negro laborer, aged 23 years, was struck on the left abdomen by a bucket containing 500 pounds of coal. Peritonitis rapidly supervened. Operation 6 hours later disclosed a rupture of the jejunum in two places, one about 1 meter from the pylorus, opposite the mesenteric attachment, transverse in direction and occupying about one-third of the circumference of the bowel, and the second about 15 centimeters nearer the stomach, running about two-thirds around the circumference of the intestine. The patient lived 4 days. The necropsy showed no leakage and no other lacerations, but there were several gangrenous spots in the intestine and mesentery, evidently the result of contusion. Case 4: A negro, aged 24 years, while lying on the ground, was struck on the back by a heavy coil of wire, weighing several hundred pounds. At operation there was discovered a rent in the left lobe of the liver dividing it completely for about 15 centimeters. It was closed by suture. The spleen and left kidney were so extensively lacerated as to necessitate their removal, and the tail of the pancreas was torn, demanding the application of ligatures to stop the bleeding. The stomach and intestines were ecchymosed, but no rupture was discovered. The patient died half an hour after operation. Case 5: A man, 22 years old, fell from the roof of a three-story building, striking with his hands and the front of his body on a pile of sand, sustaining a Colles' fracture of both wrists, with a compound dislocation of the right ulna at the lower end. He died on the seventh day, of peritonitis. The autopsy disclosed a general plastic peritonitis with an extensive stellate laceration of the right lobe of the liver. Case 6: A male, aged 35 years, engaged in blasting stone, was struck on the back, while in a squatting position, by the debris from a blast. On auscultation no respiratory sound was heard on the left side except near the apex of the lung. Over the base and lower half of the lung there was a gurgling, tinkling sound and tympanitic resonance. The heart was displaced to the right. Death occurred 24 hours after injury. The necropsy revealed a rupture of the diaphragm to the left of the pericardium, with hernia of almost the entire stomach into the left pleural cavity.

Charles L. Scudder [1] reports a case of **contusion of the abdomen with rupture of the descending colon.** J. H. M., 36 years old, was crushed between a station platform and a moving car. Over the left iliac crest was a tender hematoma, which was opened on the sixth day,

[1] Boston M. and S. Jour., Apr. 18, 1901.

evacuating a large fecal abscess. The muscles had been torn from their attachments to the iliac crest. At the extreme depth of the abscess was discovered an opening into the descending colon which admitted the tip of the forefinger. Eight weeks after the accident an unsuccessful attempt was made to close the fistula. Ten days later a second attempt succeeded. The particular interest in this case lies in the fact that the attending symptoms ordinarily would not lead one to suppose a serious injury had been received. The important sign that was misinterpreted was that of vomiting. Vomiting once after an abdominal contusion is of no especial importance. Continuous, unexpected vomiting without any apparent reason is significant of an intestinal lesion even in spite of the absence of other signs of involvement of the peritoneum.

Hartmann [1] reports 2 cases of **contusion of the abdomen** to fortify the belief presented by him in 1898 that **rigidity of the belly muscles is an imperative indication for operation,** even though other signs be absent. In one case, operation revealed a laceration of the liver. In the second case, apparently a simple contusion, but with marked rigidity, operation was not performed, and a fatal peritonitis ensued. Of 10 patients presenting this sign, 9 were successfully operated upon and distinct lesions found; the remaining patient, refusing operation, died as the result of an intestinal rupture. Of 17 patients without rigidity, and who were not subjected to operation, all recovered.

Berg [2] presented to the New York Academy of Medicine, Section on Surgery, January 14, 1901, a boy, aged 10, who had been run over by a coal cart, sustaining a severe **contusion of the abdomen.** The operation, 25 hours later, disclosed a rupture at the duodenojejunal juncture, extending about ½ inch into the mesentery. This was sutured and the lad recovered. Ten days later a second laparotomy was done for intestinal obstruction produced by adhesions around the gauze drain, since which time the boy has done well.

Thomas H. Kellock [3] reported to the Medical Society of London 3 cases of **abdominal contusion** with rupture of the viscera, causing marked symptoms of internal hemorrhage. The first case was a man of 40, who had been run over by an empty cab. Splenic dullness was increased in area. He was subjected to abdominal section and an extensively lacerated spleen was removed. Five days later he died with symptoms of obstruction, which it was afterward learned were due to bruising of the small intestine a few inches above the cecum. The second case was a man aged 32 years, who had fallen 15 feet, striking the left loin against a plank. He had hematuria and a large tumor in the renal region. Operation showed that the lower third of the left kidney had been completely torn from the upper two-thirds, necessitating a nephrectomy. Recovery ensued. The third case was a woman aged 55, who had been run over by a cab, sustaining a laceration of the spleen and liver. The spleen was removed and the rent in the liver packed with gauze, but the patient did not survive the operation. In the subsequent dis-

[1] Bull. et Mém. de la Soc. de Chir., Mar. 12, 1901. [2] Med. Rec., Feb. 2, 1901.
[3] Lancet, Mar. 30, 1901.

cussion Mr. C. S. Wallace referred to the series of cases collected by Makins,[1] which include 88 cases of ruptured viscera, 21 of which were ruptures of the intestine, and 35 ruptures of the kidney.

Arthur E. Barker[2] details the history of an instructive case of **abdominal contusion followed by stricture of the intestine and pernicious anemia.** A man, aged 28 years, had been in good health until 7 years ago, when he was run over by a loaded wagon, sustaining fractures of 5 ribs, the wheels having passed over the lower thorax. He was ill for 14 weeks with "pleurisy and inflammation"; since then he has had periodic attacks of pain, vomiting, and diarrhea. He was extremely weak and anemic, the blood-count showing 2,000,000 red corpuscles, 54,000 white corpuscles, and 30% hemoglobin. Later, the count showed 1,000,000 erythrocytes, hemoglobin 20%, and white corpuscles 11,450. He was subjected to laparotomy, and an enormously thickened small intestine, terminating to the right of the spine in a sharp kink among many old smooth adhesions, was found. Below this the intestine was normal and empty. An anastomosis was effected between the distended loop and the empty portion below by means of sutures alone. The patient died 2 days later. At autopsy the cause of distention was seen to be a tight stricture of the gut about 7 feet from the commencement of the jejunum. The crushing injury from the cart-wheel had also caused adhesions between the transverse colon and adjacent small intestine and had destroyed the upper end of the right kidney, which was converted into a fibrous mass. The second portion of the duodenum showed several cicatrices the result of tearing of the peritoneum at the time of the accident 7 years before. The stricture was found to be due to a contraction of an ulcer produced by the crushing of the mucous membrane where the cart-wheel caught it against the spine. William Hunter appends an elaborate pathologic report.

Owing to the multiplicity of operative procedures employed in **intestinal suturing,** and for convenience in considering the subject as a whole, F. Gregory Connell[3] classifies the various methods as follows: (A) Foreign bodies: (1) Four Masters, and modifications; (2) invagination and modifications; (3) Senn plate and modifications; (4) Murphy button and modifications; (5) special forms. (B) Suture: (1) Glovers' and modifications; (2) invagination and modifications; (3) Lembert and modifications; (4) placing knots inside, a **new method** devised by the author. (C) Miscellaneous: Not one of these various methods has met with universal, and few of them with even general, adoption. Outside of the Czerny-Lembert and its closest imitators, the Murphy button, and Maunsell method, there are but few worthy of more than historic interest. The method of the Four Masters, the first authenticated instance in which a foreign body was used to aid intestinal suturing, consisted of the employment of a goose trachea of suitable caliber, over which the divided ends of the bowel were drawn and anchored in place. It was so named after four monks who practised

[1] Ann. of Surg., 1899. [2] Lancet, July 21, 1900. [3] Medicine, Apr., 1901.

EXPLANATION OF PLATE I.

a, suspending loop; *b*, *b*, and *c* are made with one thread inserted at a point intermediate of the distance from the anterior border. The needle with suture is passed through the four walls of the cut ends, and that portion of suture which lies in the drawn loop is drawn up and fastened, then cut, and the continuous thread is left at the point indicated by the arrows; thus having one small knot suspending loop which divides the circumference of each cut end into thirds. Instead of suspending from suspending loop which divides the circumference of the bowel into thirds, we may use two loops, and thus divide the circumference into halves; or, if available, the "bulbs" described by R. Ball, or an omentum, or mesenteric triangular flap will be found a most efficient aid in maintaining the proper relations of the parts. (The description of the instrument will be found in the "Annals of Surgery," January, 1891.)

b, *b*, loop *b* has been cut away, and loop 1 takes its place in one bend of the suture; with loops 2 and *g* held in the other hand, thereby indicating into apposition that portion of the walls to be included in the second third of the suture. The operator counts the sutures in the points of insertion of loops 2 and *g*, where again a knot exists, to take up the sutures and prevent a premature detachment of the suture. The white deposits in the series of illustrations, representing mucosa, show that portion of the intestinal wall not covered by peritoneum, at the mesenteric border, has been secured in the suture.

c, The needle, after having entered the lumen, is passed out again on the same side, *h*, inch distant; then over to the opposite cut end, where it is inserted from without in, and again emerges from within out, on the same side. This step—the taking of a bite—is repeated alternately on opposite margins until the necessary number of stitches have been inserted. It will be observed that when the needle enters the lumen the last time, it makes what might be termed a "half-stitch," as it does not return again through the wall; but having reached the point where the suture was commenced, the free end and the needle end will complete the last stitch, when tied, on the mucosa. The needle at this point is then brought out of the lumen at the angle of wound alongside of the free end of the suture. The cross-over stitches are next carefully drawn up, thus bringing into contact the opposing serous surfaces at every point except where the sutures are still present.

d, The free end of threaded needle is made to emerge alongside of the suture ends, and is then withdrawn a little, which causes the thread to form a loop, through which the assistant passes the ends of the suture. The operator then withdraws the threaded needle, at the same time bringing with it the suture ends, and they present at the point of withdrawal of the needle. The serous coats through which the sutures at the cut ends are now in apposition, and the suture ends can be tied.

e, By slight traction on the suture ends the opposing serous surfaces are brought in close contact; the suture ends are then tied firmly, and drop between the serous coats, thus lying the knot upon the serous coat, and the ends then cut off short.

Intestinal suture with knots inside (F. Gregory Connell, in *Medicine*, Apr., 1901).

EXPLANATION OF PLATE 1.

a, Suspending loops *2*, *3*, and *4* are made with one thread inserted at a point two-thirds of the distance from mesenteric to convex border. The needle with suture is passed through the four walls of the cut ends, and that portion of suture within each lumen is drawn up to a sufficient length, then cut, and the contiguous threads tied at the points indicated by the arrows; thus having as a result four suspending loops dividing the circumference of each cut end into thirds. Instead of employing four suspending loops which divide the circumference of the bowel into thirds, we may use but two loops, and thus divide the circumference into halves; or, if available, the "holder" devised by Dr. E. H. Lee can be recommended highly, and will be found a most efficient aid in maintaining the cut edges in apposition. (The description of the instrument will be found in the "Annals of Surgery," January, 1901.)

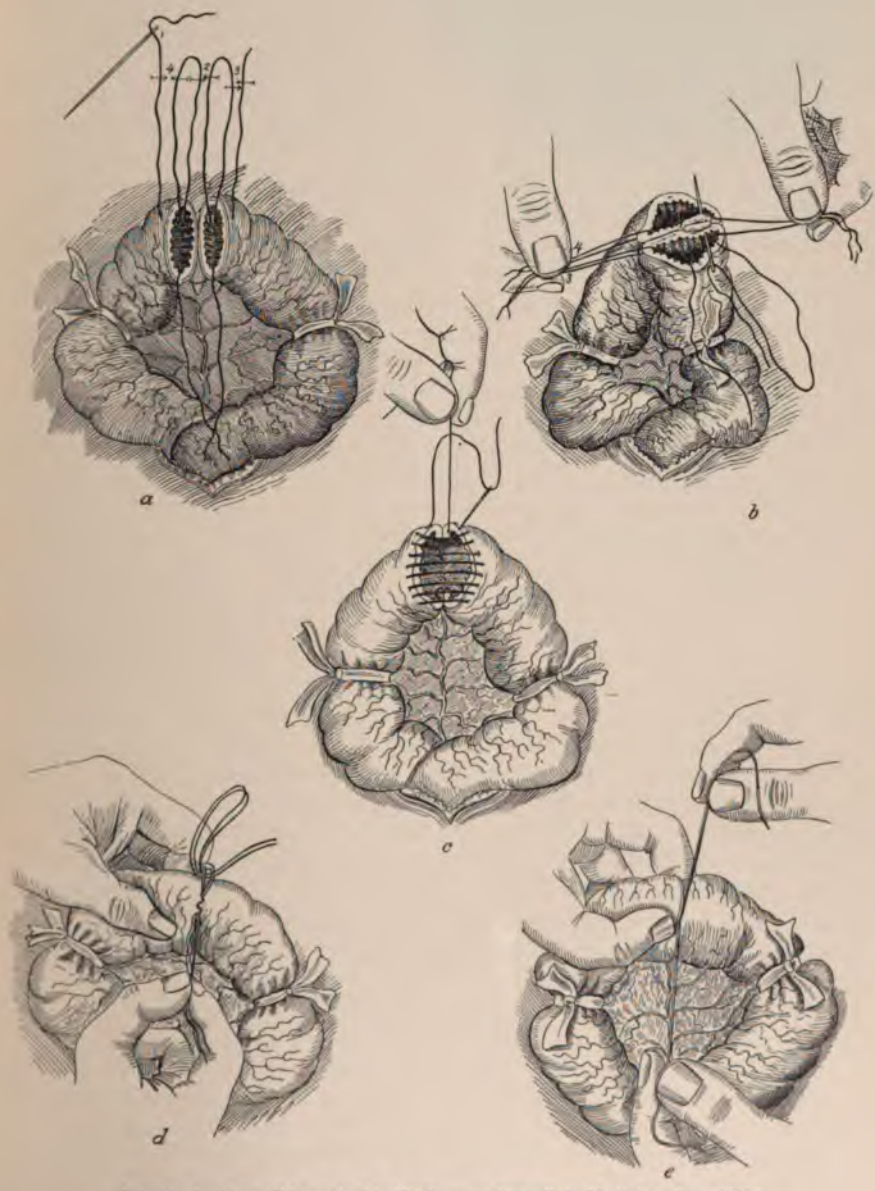
b, Loop *2* has been cut away, and loop *1* takes its place in one hand of the assistant, with loops *3* and *4* held in the other hand, thereby bringing into apposition that portion of the walls to be included in the second third of the suture. The operator continues the suture to the points of insertion of loops *3* and *4*, where again a back stitch is taken, to fix the suture and prevent a purse-string contraction of the same. The white elevation in the center of illustration, representing mesentery, shows that that portion of the intestinal wall not covered by peritoneum, at the mesenteric border, has been secured in the suture.

c, The needle, after having entered the lumen, is passed out again on the same side, ⅛ inch distant; then over to the opposite cut end, where it is inserted from without in, and again emerges from within out, on the same side. This step—the taking of a bite—is repeated alternately on opposing margins until the necessary number of stitches have been inserted. It will be observed that when the needle enters the lumen the last time, it makes what might be termed a half-stitch, as it does not return again *through* the wall; but having reached the point where the suture was commenced, the free end and the needle end will complete the last stitch, when tied, on the mucosa. The needle at this point is then brought out of the lumen at the angle of wound alongside of the free end of the suture. The cross-over stitches are next carefully drawn up, thus bringing into contact the opposing serous surfaces at every point except where the suture ends still protrude.

d, The eye-end of threaded needle is made to emerge alongside of the suture ends, and is then withdrawn a little, which causes its thread to form a loop, through which the assistant passes the ends of the suture. The operator next withdraws the threaded needle, at the same time bringing with it the suture ends, and they present externally at the point of withdrawal of the needle. The serous coats throughout the entire circumference are now in apposition, and the suture ends can be tied.

e, By slight traction on the suture ends the opposing mucous surfaces are brought in close contact; the suture ends are then tied firmly, and deep between the serous coats, thus tying the knot upon the mucous coat, and the ends then cut off short.

PLATE I.



Intestinal suture, all knots inside (F. Gregory Connell, in Medicine, Apr., 1901).

and became famous in the thirteenth century. The principle involved we find employed extensively up to the present day. The most recent manifestation of this particular application of the foreign body is the inflatable rubber cylinder of Halsted. The question as to whom is due the credit of first employing rubber bulbs in intestinal suturing seems to be doubtful. Connell calls attention to the fact that Treves, as early as December 12, 1882, presented at the Medico-Chirurgical Society of London what is practically the same idea. The original invagination method was by suture alone. Later, foreign bodies and sutures were used. The procedures of Senn, Robinson, Paul, and Jessett are typical examples, rubber being utilized in the first two, and decalcified bone in the latter two. In 1887 Senn presented the decalcified bone plate, which was the beginning of intestinal surgery in America; but this, with its many modifications, has been pushed aside by more trustworthy methods. The mechanical contrivance par excellence is the Murphy button, the ideal method in all but one feature—that of the insertion of a large foreign body into the intestinal canal. Its most important modification is the "decalcified bone coupler" of Frank, wherein the aim is a combination of the admirable qualities of both the decalcified bone plates and the Murphy button. Under special forms in Connell's classification we note a variety of procedures which are of historic value only. The Glovers stitch, the first intestinal suture we know of, has been entirely abandoned. The first recorded case of recovery following circular enterorrhaphy for complete transverse division of the bowel was that of Ramdohr, about 1730. He inserted one cut end into the other, and retained the parts in position by a single suture at the convex border. Jobert, in 1882, inverted the distal end, inserted the proximal segment into it, and secured the bowel by suture penetrating all the coats. In 1889 Chaput obtained union by invagination after removing the mucosa from one end, thus securing serofibrous union. Lembert presented his suture in 1826. It has been modified by Dupuytren, Cushing, and Halsted. Under miscellaneous are classed various methods which in principle differ from both suture alone and the introduction of a foreign body, such as the "clamps" or "holder" of Mudd, Grant, Morrison, LaPlace, McLean, Downes, Ferguson, O'Hara, and E. H. Lee, which hold the divided ends in place till the suture is all but completed, and then are withdrawn, leaving no foreign body behind. In the primitive method of operative interference for intestinal injury,—the formation of an artificial anus,—the knot was not only on the outside of the intestinal wall, but outside of the abdominal wall. Next it was placed outside the intestine anchored to the abdominal wall, then outside the intestinal wall in the free peritoneal cavity, then outside the intestine, buried between the serous surfaces, and finally inside the intestine or outside the body, thus completing the circle. During the time this progressive involution of the knot was occurring, another gradual improvement was taking place—*i. e.*, regarding the amount of tissue included in the stitch. The steps in this progression are: Suture including all coats, knot on serosa; suture including peritoneum only; suture including

peritoneum and muscularis; suture including peritoneum, muscularis, and submucosa; suture including all coats, knot in the lumen of the gut. Among the more important methods which have been presented to the profession in which knots are placed in the lumen may be mentioned the plans of Vesein, Bishop, Czerny, Maunsell, Ullman, Hartigan, Cheatle, and Wiggin. In none of these methods are all the knots placed in the lumen. The advantages gained by locating the knot within the lumen are as follows: (1) No foreign body; (2) early passing away of suture material; (3) decrease in adhesions to neighboring organs; (4) perfect serous approximation; (5) increased security; (6) smaller diaphragm; (7) less danger of necrosis; (8) suture may penetrate all coats of bowel-wall. Connell's method is in effect similar to Maunsell's, but it does away with the necessity of the second incision and the invagination. It has been performed upon the human being 11 times. Three perished, 2 of shock and 1 on the eighth day, but in all post-mortem examinations disclosed an intact line of suturing. These operations have been performed by F. H. Martin, E. W. Andrews, A. H. Ferguson, W. E. Schroeder, Emil Ries, and also by the writer.

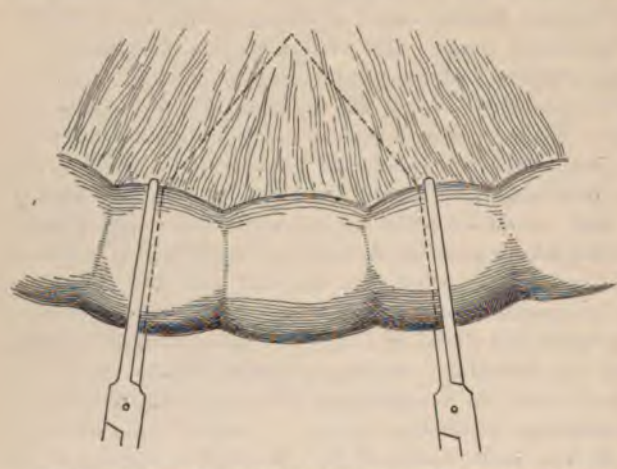


Fig. 23.—Showing the manner of placing forceps in resection of bowel; dotted lines show the incision to be made (O'Hara, in Ann. of Surg., Feb., 1901).

M. O'Hara, Jr.,[1] presented to the Philadelphia Academy of Surgery, May 7, 1900, a new **instrument for performing anastomosis of hollow viscera.** The instrument consists of two pairs of straight forceps, the jaws of which are very slender and $2\frac{1}{2}$ inches long, for ordinary work; for special work they may be made longer. Instead of being roughened as in ordinary hemostatic forceps, they are grooved down the center of one blade; the opposite blade has a ridge similar to a pile clamp; both forceps are held together by means of an adaptation of the serre-fine. With this single instrument one may perform any of the gastrointestinal operations and the various gall-bladder operations. To perform an end-to-end anastomosis the serre-fine is removed, and one forceps placed transversely across the bowel at the point selected for the upper border of the resection, and locked; the other forceps is

[1] Ann. of Surg., Feb., 1901.

placed in the same manner at the lower margin of the resection. The tips of each forceps should be on an exact line with the mesenteric attachment. Forceps are placed upon the ends of the intervening portion of the intestine to prevent leakage. Next sever the bowel close to the forceps, removing a wedge of mesentery. The two forceps are then brought together and held by the serre-fine clamp. The sutures are introduced, beginning at the point nearest the lock, carrying them to the tip of the forceps, and then suturing from the tip to the heel on the opposite side after the forceps have been turned over. The forceps are now unclamped and one pair removed by unlocking and drawing it out in a straight line. After unlocking the second forceps, pass it into each segment of bowel to insure that both walls of the gut have not been included in any of

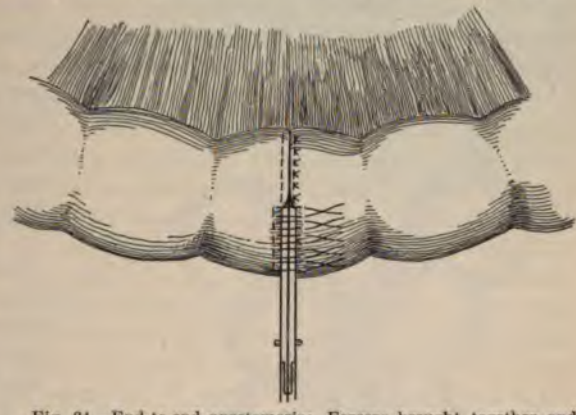


Fig. 24.—End-to-end anastomosis: Forceps brought together and held by serre-fine (not shown); sutures introduced, some of which are tied (O'Hara, in Ann. of Surg., Feb., 1901).

Fig. 25.—Lateral anastomosis: Forceps applied in a line with the long axis of the gut (O'Hara, in Ann. of Surg., Feb., 1901).

the sutures. They are then withdrawn and the remaining opening closed with one stitch. A reinforcing row of sutures may be inserted if desired. To anastomose bowels of unequal caliber, after the forceps have been placed on either gut and the resection made, suture the entire

circumference of the smaller to the large bowel and remove the forceps on the smaller segment. The portion of large gut projecting beyond the small intestine is invaginated and sutured and then the forceps are removed. The methods of performing lateral anastomosis and invagination are depicted in the accompanying illustrations. The advantages claimed for this method are: Reduction of the danger of sepsis, the bowel being closed off before it is cut; rapidity; accuracy; wide range of application; and simplicity.

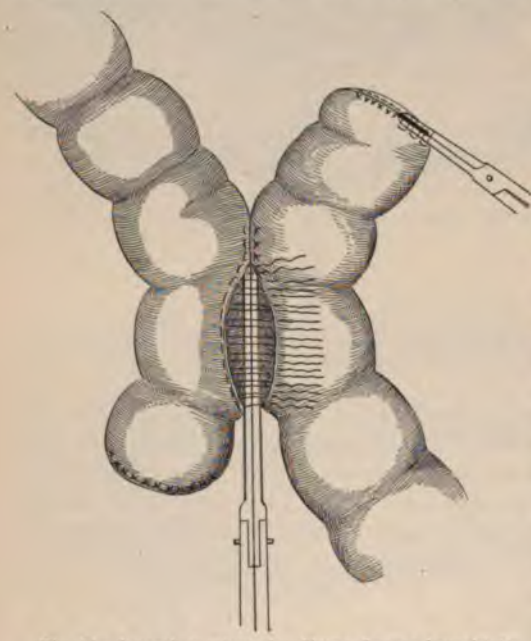


Fig. 26.—Lateral anastomosis: Shows forceps brought together and held by serre-fine (not shown); sutures introduced, some of which are tied; also shows manner of placing forceps in invagination with sutures applied, some of which are tied (O'Hara, in Ann. of Surg., Feb., 1901).

William Osler [1] read a highly instructive paper on **perforation in typhoid fever** before the Philadelphia County Medical Society, January 9, 1901. He said that it is not the complications that kill most of the patients, but the toxemia. Among 100 fatal cases, 50 proved fatal because of the progressive asthenia, 30 because of perforation, and 20 because of other complications. Of 63 deaths in the first 10 years of the work at the Johns Hopkins Hospital, nearly one-third were due to perforation. Among the fatal cases, the relative proportion due to perforation has become higher, owing to the striking reductions in the death-rate of the toxemic group. The perforation is usually within 18 inches of the ileum. The higher in the bowel, the more likely is the perforation to be in a small ulcer, without much infiltration or necrosis of the walls. The position of the terminal loops of the ileum makes the first symptoms of perforation hypogastric, and may give to the case a pelvic or appendicular aspect. The earlier the perforation, and the closer to the ileocecal valve, the greater the risk of widespread necrosis of the mucosa and a condition of the gut most unfavorable for any surgical procedure. He divides the accident into two stages: First, the perforation itself; and secondly, the consecutive peritonitis. He illustrates the uncertainty of diagnosis by citing 3 recent cases. The first was in a man aged 24, who had been ill more than a month. The following symptoms suggested the possibility of perforation: Sudden onset and

[1] Proc. Phila. Co. Med. Soc., Jan., 1901.

persistence of pain; marked tenderness and moderate muscular rigidity; gradually increasing distention; and suggestive movable dullness in the flanks. There was no drop in temperature, no special increase in the pulse-rate, no collapse, no nausea or vomiting, no obliteration of the liver dullness, no muscle spasm, no marked diminution of the abdominal respiratory movements, and no leukocytosis. This patient was operated upon 9 hours after the onset of pain, and a perforation found in the pelvic coils. The peritoneum was reddened, but there was no lymph. He died 1 week later, apparently from the effects of the fever. The second patient had a severe hemorrhage on the fourteenth day of disease, 1 hour after which he complained of severe abdominal pain. There was absence of any definite abdominal changes until nearly 24 hours later, during which time the leukocytes rose until they finally reached 17,500 and the liver dullness gradually became obliterated. He was operated upon after a second severe hemorrhage, with peritonism well marked. About 12 centimeters from the cecum there was a large gangrenous ulcer, which presented 2 perforations. Sutures would not hold, and before anything could be done the patient died on the table. The third patient, aged 8 years, complained of abdominal pain almost from the beginning of his fever. On the eighteenth day of disease, the pain increased in severity; there developed leukocytosis, absence of liver dullness, movable dullness in the flanks, abdominal rigidity and distention, and a rapid pulse. As nearly as could be judged, operation was done 8½ hours after the perforation, which was 10 centimeters distant from the cecum, clean and punched out. Recovery ensued uneventfully. The time-honored picture of perforation, with the Hippocratic facies, the feeble-running pulse, the profuse sweat, the distended motionless abdomen, must be erased, as not a picture of perforation, but of peritonitis, or, better, a rough draft of death. What we need is a fuller knowledge of the symptoms of perforation apart from those of the consecutive peritonitis. Perforations are more liable to occur in the more severe cases during the height of disease, and in cases with diarrhea and tympany. Six occurred with hemorrhage. Of 16 patients operated upon, 6 recovered—37.5%. Osler believes one-half of the cases occurring in hospitals should be saved.

Lejars,[1] at a meeting of the Société de Chirurgie de Paris, December 12, 1900, in behalf of Lengueu, reported two examples of **intestinal perforation in the course of enteric fever.** The first was in a boy aged 10. Operation was performed 2 hours after the signs of perforation. The systemic conditions were unfavorable and death quickly followed. The second patient was 15 years old and recovered after operation. The ulcers were simply sutured. Lejars reported a case of his own, a student who infected himself in the laboratory. The symptoms of perforation had long been present. An ulcer 3 centimeters from the cecum was sutured. The patient died the same day. Rochard reported 3 fatal cases and a case in which no perforation was found, recovery ensuing. Walther narrated a case in which he

[1] Med. News, Feb. 16, 1901.

refused to operate because of the marked prostration. In a few days the urine showed the establishment of an intestinovesical fistula.

In a study of **peritoneal infection in typhoid fever,** George B. Shattuck, J. Collins Warren, and Farrar [1] report 24 cases subjected to abdominal section. In 17 perforation of the intestine was found; in 2 there were threatened perforations; in 1, a ruptured mesenteric gland; in 1 the cause was presumably perforation; and in 3 no infection was found. Eighteen were males, 6 females. In 15 of the 18 mild cases perforation or general septic peritonitis was present. In 5 cases the symptoms appeared at the end of the second or beginning of the third week; in 8 at the end of the third week; in 1 during the fourth week; in 4 during the fifth week; in 1 during the ninth week; and in 1 during the eleventh week, during a relapse. Six of the 24 (25%) patients recovered. In the 21 cases of actual infection the symptoms appeared suddenly in 7, and operation was performed within 12 hours in each case. The average time ensuing after the onset of symptoms in the 14 remaining cases was 23 hours. In 3 of the 21 recovery ensued—14.3%. The writers reach the following conclusions: (1) In many very sick cases of typhoid perforation or peritoneal infection cannot be diagnosticated until the results are already widespread and of fatal extent. The chances of a fatal issue from an abdominal operation in such cases are overwhelming. (2) In mild cases in fair general condition an abdominal operation is readily borne, provided no peritoneal infection is present. (3) A small number of mild cases may have sudden perforation with free extravasation. In these the symptoms are fulminant, but localized to a great extent, and in these (4) operation must be done at once, for general infection may be past relief in from 1 to 5 hours, and walling off of the perforation by protecting adhesions is so rare as not to be counted upon. (5) In the majority of mild cases, beginning infection (whether from perforation or not) is marked by comparatively slight symptoms—local pain, tenderness, spasm, and leukocytosis. The severe subsequent symptoms are due to general peritonitis. (6) These warning symptoms demand serious consideration and study, but in many cases are either not rightly understood or not acted upon. (7) Complaint of abdominal pain in a case of typhoid should always lead to a suspicion of beginning peritoneal infection. (8) Frequent leukocyte-counts are needed in every case of typhoid. In the presence of abdominal pain an hourly count is necessary. (9) Pain associated with local tenderness and muscular spasm and a rising white blood-count points in most cases to the advisability of an operation; in all cases to the necessity for a surgical consultation. (10) In not a few of this series of cases operation was imperative a varying number of hours before it was done. If it can be appreciated that the severe symptoms usually mean general peritonitis, it must be understood that the milder and earlier symptoms are the important ones.

William Taylor [2] publishes the notes of 2 cases of **perforation in**

[1] Boston M. and S. Jour., June 28, 1900.
[2] Dublin Jour. Med. Sci., Jan. 1, 1901.

enteric fever. The first case was a woman, who, while convalescent from enteric fever, was suddenly attacked with abdominal pain and syncope. Two days later an operation was performed and disclosed general peritonitis, 3 small collections of pus in the mesentery due to softened lymph-glands and a suppurating right ovary. The typhoid fever relapsed, and on the fifteenth day after operation perforation of the bowel occurred. The perforation, measuring ½ inch, was sutured and gauze drainage inserted. The patient did well until 15 days later, when feces were seen coming from the wound. She died a few hours later. The necropsy showed a second perforation about 1 inch from the first perforation, which had entirely healed. The second case was in a woman, aged 28 years, in whom perforation occurred during the fifth week of a severe attack, and who was operated upon between 5 and 6 hours later. She died 6 hours after operation.

A. A. Berg [1] presented to the New York Academy of Medicine, Section on Surgery, January 14, 1901, a boy aged 7, on whom he had operated for **perforation** occurring during an attack of **ambulatory typhoid fever.** The operation, performed about 24 hours after the onset of symptoms, revealed suppurative peritonitis and a perforation about midway between the pylorus and cecum.

Bolton [2] reports a death following laparotomy for **perforation during typhoid fever,** and reviews the whole subject of operation for perforation.

E. G. Cutler and John W. Elliot [3] report a case of **recovery following laparotomy in the preperforative stage.** The patient, aged 19, was suddenly seized with severe abdominal pain during the third week of an attack of enteric fever. The abdomen became moderately distended, rigid, and tympanitic. The leukocytes rose from 8000 to 17,000. The abdomen was opened 4 hours after the beginning of the pain, revealing a general septic peritonitis. About 4 feet from the cecum an ulceration, the center of which was just ready to slough out, was seen and infolded by Lembert sutures. The temperature fell to normal the next day, and the patient convalesced rapidly until the eighth day, when fever reappeared and he passed successfully through a relapse of enteric fever.

At a meeting of the Philadelphia Academy of Surgery, October 1, 1900, R. G. LeConte [4] called attention to the **early date at which typhoidal perforation may occur,** to the difficulty in anomalous cases of differentiating typhoid from appendicitis, and detailed the history of a man, 23 years old, on whom he operated for acute appendicitis, the history being typical of this condition, and there being a small tumor in the right iliac fossa. At operation the mass was found to be composed of cecum and ileum glued together by adhesions. On the iliac and cecal walls were seen some 6 or 7 necrotic Peyer's patches that had ulcerated through to the peritoneum. The appendix was normal. The diseased intestine was packed off with gauze and the incision left open.

[1] Med. Rec., Feb. 2, 1901.
[2] Annual Report Met. Asylums Board, 1899.
[3] Med. Rec., Dec. 22, 1900.
[4] Ann. of Surg., May, 1901.

Thirty-six hours later feces appeared in the discharge. Four weeks later the fecal fistula had closed. The patient passed successfully through a typical attack of typhoid fever.

Harvey Cushing [1] advocates prompt surgical interference for **intestinal perforation in typhoid fever,** and reports a recovery after laparotomy. According to statistics, more than two-thirds of all recorded laparotomies for perforative peritonitis occurring during enteric fever have been performed in America. The mortality is probably greater than the literature indicates, because of the reluctance of many operators to publishing fatal cases; the results, however, are such as to make operation imperative. In forming statistics he urges that a distinction be made between operations for perforation and operations for the consecutive diffuse peritonitis. Results depend upon the character of the infection introduced into the peritoneal cavity, the determination of which necessitates incision and culture. Cushing predicts 50 % to 60 % of recovery in the near future. Reference is made to the ease and safety of operating under local anesthesia, recovery being uninfluenced if no perforation be found. The following case is detailed: A male, aged 20 years, showed marked abdominal symptoms from the beginning of the disease. During 5 days the leukocytes ran up from 5000 to 15,000. There were several small hemorrhages. Following a bath there were collapse, abdominal pain, and rigidity, the patient subsequently passing a large quantity of blood by the anus. Forty-five hours later he presented evidences of a general peritonitis, and operation was performed under local anesthesia. Several ounces of pus were evacuated from the intestinal adhesions and a large perforation in the ileum was sutured. There were so many other ulcers which had eroded nearly through this portion of the bowel that the omentum was wrapped around it and sutured in place. The affected bowel remained directly under the incision, which was left partly open. Five days later a fecal fistula developed. This soon healed and 2 months later the patient left the hospital. Although it would have been better to have operated just after the bath, the author was misled by the patient's previous condition and because there were no positive indications. In another case exploration would be advised. The frequency of melena in cases of perforation is noted. One reason better results are reported from operations during the period from 8 to 24 hours after perforation is that patients surviving perforation for so long a time have a milder infection or else the process has been slow enough to permit a combative reaction.

In a paper contributed to the Eleventh Series of the Boston City Hospital Reports, John Y. Bottomley [2] reports and analyzes 28 cases of **tuberculous peritonitis treated by operation.** After careful discussion of the literature of the subject and of those cases from the hospital service, the following conclusions were reached: It seems only prudent to wait at least a year before reporting cases as cured. The fact that this has not been done may account in part for the great variation in the percentage of reported recoveries. Of this series of 28 cases,

[1] Ann. of Surg., May, 1901. [2] Boston M. and S. Jour., Dec. 13, 1900.

11 patients recovered and an equal number died—a percentage of 39.3. Two (7.1 %) improved, and 4 (14.3 %) could not be traced. Of the 19 cases of the ascitic type, 8 patients (42 %) recovered, 7 died, 1 improved, and 3 were not traced. Three patients (42.8 %) of the 7 fibrous cases recovered, 3 died, and one could not be traced. By most writers the ascitic form is said to give the highest percentage of recoveries following operation; but in this series operation was equally successful in both the ascitic and fibrous type. The prognosis in the ulcerative type is always bad. Tapping was tried in 6 cases; in each case the fluid reaccumulated in a very few days. The importance of early operation, so far as prognosis is concerned, is probably not great. The average time from the onset of symptoms to the time of the operation in this series is practically the same in the fatal cases as in those in which recovery ensued. To summarize: (1) We may reasonably expect cures (1 year or more after operation) in from 30 % to 40 % of all cases. In fatal cases the patients usually die within a few months after operation. (2) Family history does not appear to be important etiologically. Previous inflammatory affections of the abdominal viscera may have etiologic significance. (3) Operation usually affords at least temporary improvement either locally or generally, even in cases that later prove fatal. The use of drainage should be avoided when possible. (4) Inferences as to the remote results of operation should be drawn very guardedly, if at all, from the immediate results; though in cases which do not immediately receive from an operation either local or general benefit, the prognosis is very unfavorable.

G. W. Davis [1] records a case of **tuberculous peritonitis** much improved by operation. The patient was a girl 7 years of age, with a large tuberculous mass in the right hypochondrium and enlarged mesenteric glands. Eight months after operation the child was plump and the mass together with the lymph-nodes had decreased in size.

A. Kennedy and E. Steele [2] report a case of **tuberculous peritonitis** cured 2 months after laparotomy. The patient was 4½ years old and presented a distended abdomen and some masses appreciable on palpation.

W. L. Grant [3] reports the result of operation in 2 cases of **tuberculous peritonitis.** Both patients had pulmonary trouble and both were drained. In the first case there was ascites, the second resembled appendicitis, and the fluid present was seropurulent. The first patient is well after 6 months; the second patient also is well, but the exact time elapsing after operation is not recorded.

G. D. Miller [4] records a case of ascitic **tuberculous peritonitis** perfectly cured 3 years after operation, which consisted in the introduction of a rubber tube deep into the pelvis. This drain was allowed to remain 2 months.

Robert G. LeConte [5] reported to the Philadelphia Academy of

[1] Lancet, Feb. 2, 1901.
[2] Lancet, Aug. 25, 1900.
[3] Phila. Med. Jour., Dec. 1, 1900.
[4] Med. Rec., July 14, 1900.
[5] Ann. of Surg., Feb., 1901.

Surgery, June 4, 1900, an interesting case of **tuberculous peritonitis** cured by operation. An Italian woman, aged 17, had complained of abdominal pain and swelling for more than 2 years. The belly was tapped and 94 ounces of straw-colored fluid withdrawn. Two months later 220 ounces were withdrawn. Nineteen days later, the swelling having reappeared, the abdomen was opened. The peritoneum was thickened and covered with nodules. An encysted cavity containing fluid and cheesy material, and extending from the umbilicus to the uterus, was opened. A drain tube was allowed to remain in the abdomen 2 days; the sinus persisted and finally became fecal. One year after operation a piece of gauze about 5 feet long and a yard wide was extracted through the sinus. The entire intestinal contents were now discharged through the opening. Fifteen months after the original operation a successful attempt to close the fecal fistula was made, the diseased bowel being resected with the aid of O'Hara's forceps. A few tubercles were discernible where the bowel was sharply kinked, but the rest of the peritoneum was entirely free. Both tubes, the left ovary, and part of the right were so implicated in the dense adhesions that they were excised. LeConte calls attention to the irritation produced by the forgotten gauze sponge, which he believes was a potent factor in the cure of this case. In the subsequent discussion G. G. Davis reported an operative case which soon ended fatally.

Maurice H. Richardson [1] reported to the American Surgical Association, May, 1900, a case of **acute mesenteric tuberculosis of the ileocecal coil** in which excision was followed by permanent recovery. The patient was a boy aged 5, who had apparently been in perfect health. Following overeating he complained of abdominal pain. He was constipated. The temperature varied between 102.6° and 104.2°. On the second day a tender mass was found in the appendiceal region and a diagnosis of acute appendicitis was made. Incision revealed a healthy cecum and appendix. In the mesentery of the ileocecal coil were numerous enlarged glands, which were carefully removed. A small gauze wick was left in the depths of the wound. A microscopic examination demonstrated these glands to be tuberculous. The convalescence, however, was perfect and permanent. In cases of glandular tuberculosis limited to a single coil it must be assumed that the infection takes place directly through the intestinal wall. Cases diagnosticated as appendicitis with abscess, in which operation is simply drainage, may in some instances be tuberculous in origin. This case was attacked just as similar lesions in the neck are attacked and with a result as gratifying. It is an argument in favor of early operation when the symptoms are acute and severe, not only when the diagnosis is clear, but more especially when it is obscure. The results of operation are often excellent; the cure of tuberculous peritonitis by incision, after the removal of a tuberculous tube, after cureting of tuberculous fascia, indicate that surgical intervention in tuberculosis is a duty whenever intervention is possible. In mesenteric tuberculosis, in particular, removal of the affected glands

[1] Phila. Med. Jour., Dec. 1, 1900.

is indicated whenever their removal is technically possible. Richardson recalls but two cases of acute tuberculous adenitis of the mesentery distinctly localized. In one of these, drainage of the cheesy collection in the folds of the mesentery was followed by temporary improvement, but the patient finally succumbed to pulmonary tuberculosis. Enlargement of mesenteric glands is not infrequently found during abdominal operations for other conditions, especially operations for chronic appendicitis. It may be that in some cases the infectious process in the appendix is tuberculous, and that the general dissemination is secondary; or that the infection may have started in the cecum itself, involving later the appendix and the mesenteric glands. It is probable that the disease starts as an acute process and so closely resembles an acute appendicitis that a distinction before operation is impossible. Of acute general tabes mesenterica Richardson says he has found the glands infected as far as was deemed advisable to explore, and often environing structures were involved. Tuberculous peritonitis with ascites shows as a rule no special involvement of the lymph-glands. If it does, the prognosis is not so favorable. When large tuberculous masses are found at operation, some of the cases slowly waste away, others develop fecal fistulas, and some permanently recover for reasons difficult to state.

John F. Erdmann [1] presented to the New York Surgical Society, May 9, 1900, a **boy of 19** on whom he had performed an exploratory operation for **carcinoma of the peritoneum and intestines,** the diagnosis being corroborated by microscopic examination. The primary tumor was probably in the rectum. The symptoms were abdominal pain and bloody stools. The case was inoperable. Erdmann also mentioned a patient, aged 20 years, whom he had treated for carcinoma of the intestines.

Richard H. Harte [2] reported to the Philadelphia Academy of Surgery, January 8, 1900, a case of **sarcoma of the intestines in a child** aged 5 years. The patient perished from inanition after an exploratory incision. The mass apparently started in the mesentery and involved a portion of the small intestine occupying the right iliac fossa. Microscopic examination demonstrated the mass to be a lymphosarcoma of the small round-celled variety.

Albion [3] has collected 10 cases of **intestinal sarcoma in children,** all of which were round-celled. The disease is rapidly fatal, often terminating within 2 months of its apparent beginning. Heredity was not noted. Direct traumatism was mentioned in 2 cases. Metastases occurred in three-fifths of the patients.

Smoler, [4] in discussing 13 cases of **sarcoma of the intestines,** says they are sarcomas of a mixed cellular type, always infiltrating, and frequently metastatic. Of 13,036 autopsies, sarcoma of the intestine was found 13 times, 7 in the ileum, 3 in the ileum and jejunum, and 2 in the cecum.

[1] Ann. of Surg., Oct., 1900.
[2] Ann. of Surg., Oct., 1900.
[3] Des Fibriones Embryonnairs de l'Intestin chez l'Enfant, Paris, 1898.
[4] Prag. med. Woch., Bd. XIV, 1898.

C. Van Zwalenburg [1] reports a case of **sarcoma of the intestines in a child** 5 years old. The parent died of carcinoma. Five months before operation the patient fell from a fence, was caught between two boards, and held hanging on the abdomen. The symptoms were anorexia, vomiting, abdominal pain, and emaciation. A nodule was detected in the left hypochondrium. At operation the growth was 4 inches long and 3 wide, consisting of a contracted thickened mass with a partial intussusception of the ileum into the colon, drawing the appendix with it. Several of the mesenteric glands were involved. The ascending colon, 6 or 7 inches of the ileum, and all the enlarged glands were removed. The ends were anastomosed with the Murphy button. The patient recovered; the button passed 6 months after operation. On microscopic examination the growth proved to be a round-celled sarcoma. A table of 15 cases in which resection was done is appended. In addition to these, 2 inoperable cases are mentioned in which exploration alone was done, one by Madelung and one by Tschermakowski. Death followed in a few days in both cases. Of the 15 cases in which resection was done, 9 were in males and 5 in females. The youngest was 1½ years old, the oldest 52, 5 were under 10 years, 1 between 10 and 20, and 2 between 20 and 30; 1 was 30, and 5 between 40 and 50 years. The small intestine alone was involved ten times; both small and large intestine twice; the cecum once; the transverse colon twice. The Murphy button was used in 4 instances. Of the 15 patients, 9 recovered from the operation. The cause of death in the 6 fatal cases was: peritonitis, twice; sepsis and pneumonia, once; collapse, once; not stated, 2 cases. Of the children under 10, only 1 succumbed to operation. Of those surviving operation, 1 died after 3 weeks, another in 2 months, from widespread metastasis. Two were well 1 year after operation; 1 is well 6 months after. Mesenteric glands were reported enlarged in 4 of the patients who recovered.

Fenton B. Türck,[2] from observations and experiments, believes that **in the presence of shock there is lower resistance to infection,** and that there is increased resistance to infection when heat is applied internally for the mitigation of shock. The heat may be applied to the splanchnic area by introducing into the stomach a thin rubber bag, provided with an inlet and outlet tube through which hot water may be passed. Another method is that of introducing small and thin rubber hot-water bags covered with gauze into the abdomen during operations. As the skin of the abdomen is a source of infection, Türck advises cementing to it a thin rubber-dam.

During recent years many cases have been reported in which **abdominal tumors, apparently malignant, have ceased to grow and have sometimes entirely disappeared** as the result of a simple abdominal exploration. Arnold W. W. Lea [3] relates the history of a woman, aged 63, on whom he operated 42 years ago for a **large pelvic sarcoma** apparently developing from a fibroma in the right broad ligament. The

[1] Jour. Am. Med. Assoc., Mar. 9, 1901. [2] Phila. Med. Jour., Mar. 30, 1901.
[3] Lancet, Feb. 9, 1901.

abdomen was filled with chylous fluid and the growth found to be inoperable. At the present time the growth, although palpable, is much smaller, and the patient's general condition is excellent. There is no record of a corroborative microscopic examination.

Joseph Wiener, Jr.,[1] writes on **intraabdominal torsion of the omentum** and reports a case. A man, aged 79 years, with a right side inguinal hernia, was attacked with pain in the right inguinal region, which subsided in 24 hours. Three weeks later the pain returned, was cramp-like in character, and unattended with vomiting, fever, or constipation. A tumor being found in the right abdomen, a diagnosis of abscess was made, and the abdomen opened. The mass proved to be a piece of omentum as large as the palm of a hand, twisted on itself five or six times, and adherent by its tip to an epiploic appendage of the ascending colon. There are but 6 other cases on record. Two occurred in females. The condition has not been met with in youth, and is found only in individuals with hernia. The affected portion of omentum may be small or may involve the entire omentum. The cause can generally be traced to forcible attempts at reduction of a hernia. In no case was the diagnosis made before operation. Attention is called to the importance of investigating the omentum for torsion, if, during a hernia-operation, a strand of omentum is found in the inguinal canal.

In the 8 years during which the **Murphy button**[2] has been used, the following conclusions regarding it have been reached: (1) It approximates without suture. (2) The time of operation is much shortened. (3) The union is ideal. (4) There is no contraction of the scar. (5) The physiologic function of the gut is not interrupted at any time. There are two great objections to the use of the button: (*a*) The opening may be occluded by food or other particles prior to the sloughing of its attachment. (*b*) There may be prolonged retention of the button in the gut or abdominal cavity. Both these matters are of small moment, there having been but 3 fatal cases traceable to these causes in a total of 1620 that have been reported. End-to-end anastomosis, which formerly yielded a mortality of 50% to 100%, now shows a mortality of about 19.7%. This seems to demonstrate the great value of the button in gangrenous hernia when the mortality reached the ebb figure of 14%. It was for cholecystenterostomy that the button was devised, there having been but 11 cases recorded prior to its introduction. Murphy formerly recommended it in every gall-bladder case, but now restricts its use to conditions in which there is permanent obstruction to the common duct. The mortality is 14.7%.

John F. Erdmann[3] reports 3 cases of **intestinal obstruction due to Meckel's diverticulum,** presenting a pronounced resemblance to appendicular involvement; indeed, in 2 of the cases there was an existing appendicular complication. The first patient was operated upon 26¼ hours after a sudden seizure of abdominal pain. The peritoneal cavity was filled with offensive bloody fluid, and 7 feet of small intestine were

[1] Ann. of Surg., Nov., 1900. [2] Med. News, July 7, 1900.
[3] Med. Rec., Oct. 27, 1900.

gangrenous, due to a constriction of a Meckel's diverticulum which was attached to the umbilicus and to the ileum about 3 feet from the ileocecal junction. The bowel was simply liberated and excluded from the abdomen. He died about 6 hours later. The second case was operated upon for appendicitis. A large quantity of dark brown liquid was evacuated and a coil of small intestine fully 5 feet long, dark brown and edematous, was found with a Meckel's diverticulum tied around its base. The appendix was adherent and contained concretions. Both the appendix and Meckel's diverticulum were excised. Recovery ensued. In the third case an acutely inflamed appendix was removed, and a diverticulum with a mesentery was found adherent to the parietal peritoneum of the right hypogastrium. The apex was gangrenous and about 6 inches of bowel were partially strangulated by a band in the immediate vicinity. The diverticulum was amputated. Recovery was uncomplicated.

C. R. Darnall [1] reports a case of **gangrenous inflammation of Meckel's diverticulum simulating appendicitis.** At operation the appendix was found to be normal. The patient died of peritonitis 2 days later. The autopsy demonstrated a Meckel's diverticulum firmly attached to the umbilicus. It was patulous and not twisted. About 2 inches from the intestine was an area of gangrene and a small perforation.

Maurice H. Richardson [2] read the history of an interesting case of **idiopathic dilation of the colon** before the Boston Society for Medical Improvement, November 12, 1900. The patient presented in the first place symptoms so suggestive of chronic appendicitis that the appendix was removed. The symptoms returned and a diagnosis of idiopathic dilation of the colon was made. Three months later a greatly dilated sigmoid flexure was excised. The patient was immediately relieved of her symptoms and her tumor, but not for long. Abdominal discomfort, constipation, and tympanitic swelling returned and persisted. One year later the abdomen was reopened and some adhesions separated without relieving the symptoms. About 3 months after this, section was again performed. It was found that a new sigmoid flexure had appeared, and had become large enough to fill the whole lower abdomen. By numerous transverse infoldings the size of the bowel was greatly reduced. This operation was completely ineffectual. Later the sigmoid was again excised and hysteropexy performed. A recent report states the local trouble to be little, if at all, better than at first. Phantom tumor, according to Richardson, is formed by a dilated intestine under a spasmodic abdominal wall. The spasm of the muscle is doubtless secondary to the intestinal lesion and dependent upon it. It is involuntary. When intestinal dilation is moderate and distributed throughout a considerable portion of the colon, relaxation of muscle spasm is followed by a flattening out of the dilated bowel and disappearance of the tumor. When, however, the dilation is excessive and limited to a small area, especially if gas does not readily escape, muscular relaxation produces no change in the contour of the tumor. Phantoms are early and moderate dila-

[1] N. Y. Med. Jour., Jan. 12, 1901. [2] Boston M. and S. Jour., Feb. 14, 1901.

tions of the colon. Such disappearing tumors will sooner or later become real ones, removable by excision only.

Wm. J. Mayo [1] read before the Olmsted County Medical Society, March 6, 1900, a paper on the **relation of the ileocecal orifice to chronic constipation,** and reported 2 cases relieved by operation. In both cases a diagnosis of chronic appendicitis had been made. In the first case appendicectomy gave no relief, and later the abdomen was reopened and the ileocecal juncture incised longitudinally for 2½ inches and the wound sutured transversely, after the manner of the Heinecke-Mikulicz pyloroplasty. At the junction of the ileum and cecum the caliber was markedly reduced, having the appearance of having a string tied around it sufficiently tight to reduce the lumen one-third. The second case was almost identical with the first. The function of the ileocecal valve is to prevent the return of material into the small bowel and to prevent the too rapid emptying of the small bowel until the process of bowel digestion is completed. The writer has in 8 cases eliminated the ileocecal mechanism as a factor in intestinal circulation, either by removing the parts or by an ileocolostomy for malignant or tuberculous disease, and in each instance the bowel movement became more loose and frequent.

Chas. N. Dowd [2] writes on **mesenteric cysts** and reports a multilocular cystadenoma occurring in the transverse mesocolon which contained pseudomucin, and which was exactly like a cystadenoma of the ovary, suggesting its probable origin as an embryonic ovarian sequestration. Cysts within the mesentery, mesocolon, mesorectum, or omentum, and even retroperitoneal cysts, may be designated as mesenteric. The occurrence of mesenteric dermoid cysts suggests a similar origin to the reported case. The occurrence of chylous cysts in the mesentery, which have the structure and appearance of ovarian and parovarian cysts, and which have in their walls lymph-vessels, suggests embryonic cysts into which there has been an effusion of chyle. The sanguineous cysts appear to be preformed cysts into which hemorrhage has taken place; hematomas in the mesentery should not be described as cysts. The presence of cysts which have the structure of the intestinal wall suggests sequestration from the intestine. Serous cysts are apparently similar in origin and structure to the cysts already considered. They are usually not situated in the path of the lacteal vessels. Hydatid cysts form a class by themselves and are due to Tænia echinococcus. If microscopic examinations of the cyst-walls and chemic and microscopic examinations of the cyst fluid are made, the entire subject should soon be understood. It is probable that all mesenteric cysts may be included in the classifications: (1) embryonic; (2) hydatid; (3) cystic malignant disease.

V. Chlumsky [3] writes on the **strength of the bowel at the site of an anastomosis.** A normal canine bowel withstood a pressure of 500 millimeters, the peritoneum giving way first, then the circular mus-

[1] Ann. of Surg., Sept., 1900. [2] Ann. of Surg., Oct., 1900.
[3] Beitr. z. klin. Chir., Bd. XXV, H. 3.

cular coat, then the longitudinal muscle, and finally the submucosa. The dead human bowel withstood 200 millimeters pressure. The site of an anastomosis in the dog requires 150 to 200 millimeters to cause leakage. Leakage takes place through the suture holes. End-to-end anastomosis seems stronger than the lateral joining. The union seems to weaken during the first 4 days, as demonstrated by pressure tests; it then begins to grow stronger, until by the tenth day it is as firm as the normal. The button anastomosis seems more secure during the early days; leakage may occur at the situation of the suture or at the site of pressure necrosis. In suture anastomosis the knot is the weakest point. After operation the diet should be liquid for the first 8 days. During the fourth day the patient should be kept most quiet.

C. L. Gibson contributes to the October and November (1900) numbers of the "Annals of Surgery" an exhaustive and important **statistical study of 1000 operations for acute intestinal obstruction and gangrenous hernia.** The material for this study, derived from publications of cases operated on between 1888 and 1898, comprises hernia, 354; intussusception, 187; bands, 186; volvulus, 121; Meckel's diverticulum, 42; gall-stones, 40; openings, 34; foreign bodies, 16; miscellaneous, 20. The most frequent causes of intestinal obstruction are intussusception and bands. The mortality is 47%. *The mortality of resection* is 74%, of artificial anus 77%. The mortality depends upon the duration of the obstruction and on its nature, being least in foreign bodies, inflicting little or no damage on the intestine (25%); then follow hernia, 34%; bands, 41%; intussusception, 50%; volvulus, 54%; Meckel's diverticulum, 55%; gall-stones, 57%; openings, 67%; such conditions producing tight constriction. *Hernia:* The mortality in males is as 1 to 2. The proportion of femoral hernias is 59%. The ratio of mortality of inguinal to femoral hernias is as 3 to 4. The mortality of resection and primary enterorrhaphy is 26%; of artificial anus, 53%. *In General:* Resection and primary reunion by suture, mortality 38%. Resection and primary reunion by apparatus (including Murphy button), mortality 36%. Resection and primary reunion by Murphy button, mortality 30%. A large proportion of deaths is due to failure of technic, such as removal of too little intestine, or imperfect suture. At least 13% of resections are attended with defects of technic, either resulting fatally or in the formation of intestinal fistulas. *Artificial Anus:* The mortality is lowest in internal obstruction, such as foreign body, and highest in obstruction by an unyielding constriction, such as a band, and lower in hernia than in internal obstruction, chiefly because the surface exposed to absorption is less. The chief sources of mortality are: The desperate character of the majority of the cases; failure to establish the opening above the site of the constriction; failure to provide for the relief of absorption of gangrenous changes in the intestine; death often necessarily occurring on this account, although the obstruction is perfectly overcome. Prominent among the drawbacks of artificial anus is the fact that it must subsequently be repaired, for in most cases there is no tendency to spontaneous closure, while minor plastic

operations are rarely efficient. Formal liberation of the intestine and secondary resection is usually an exceedingly difficult operation, as is evident by its mortality: After intestinal obstruction, 43%; after gangrenous hernia, 27%; average, 30%. The causes of death after operation fall into three main groups: (1) From causes inherent to the condition and little amenable to treatment,—such as shock and preexisting peritonitis,—these causes accounting for the majority of fatalities. Improvement can only be hoped for by earlier recognition of the condition, thereby securing the performance of operative relief before the severer changes take place. (2) From causes depending chiefly on the nature and details of the operation, such as failure to relieve obstruction and defects in technic, or failure to take account of the conditions to be dealt with. (3) On intercurrent conditions. *Prognosis:* The most essential feature in the prognosis is the duration of obstruction. In early interference there is generally only one condition to be fulfilled—removal of the obstruction. With long continuance of this condition, secondary changes of the greatest gravity supervene, requiring for their relief measures of great extent and difficulty. The nature of the obstruction is the next most important factor, acting in the same way as in the first instance as to changes in the intestinal walls, the prognosis being best in internal obstruction, and worst in tight constrictions.

John J. Buchanan [1] reports a case of **traumatic rupture of the intestine** occurring in a laborer 18 years of age, after receiving a blow from a pair of tongs. The indications for operation were absence of peristalsis, slight rigidity of abdominal muscles, moderate pain, and the fact that he had vomited twice. Operation was performed 6 hours after injury. The rupture, about the diameter of a lead-pencil, was approximately at the junction of the jejunum and ileum. The peritoneum was already inflamed and contained seropus. Recovery ensued.

RECTUM AND ANUS.

G. Oeder [2] writes on the **treatment of hemorrhoids by elevation of the pelvis,** claiming that by this method surgical intervention is frequently set aside. The principle involved is that the varicosities are due to the weight of the blood column, the venous blood traversing the great distance from the anus to the heart before it receives any support from valves, and that by placing the anus above the heart gravity will reduce the congestion and so relieve pain. The pelvis is raised by means of pillows until it is about 10 inches above the heart. During an acute attack 1 or 2 nights' rest in this position is often all that is necessary, and even chronic cases may be cured by prolonged use of this posture during the sleeping hours.

Ellsworth Eliot, Jr.,[3] describes a **new operation for hemorrhoids** which he has used for 6 months with excellent results. After the cus-

[1] Ann. of Surg., Nov., 1900.
[2] Zeit. f. diätet. u. physikal. Therapie, Bd. IV, No. 8, S. 901.
[3] Med. News, Dec. 1, 1900.

tomary preparation the sphincter is stretched and the hemorrhoids allowed to protrude. Opposite the base of the pile, parallel with and corresponding to the mucocutaneous junction, a curved incision is made and carried upward in the same plane as in a Whitehead operation beneath the pile-bearing area, until the base of the hemorrhoid is reached. A second curved incision is then made in and through the mucous membrane, forming an ellipse with the first-mentioned incision, and including within this ellipse any area of ulceration at the base of the hemorrhoid. From the junction of the two curved incisions—that is, from the pole of the ellipse—an incision is carried vertically upward through the mucous membrane only and the resulting quadrangular flap of mucous membrane is reflected from the surface of the underlying hemorrhoidal area, having its base of blood-supply superiorly. After the dissection of this flap the same vertical incision is deepened through the hemorrhoidal tissue proper, the resulting hemorrhage being slight owing to the direction of the incision, thus forming a rectangular mass of hemorrhoidal tissue which is transfixed at its base with stout catgut; the ligatures are tied tightly and the mass cut away. The rectangular flap of mucous membrane is then stitched to the skin, and the retention of any discharge prevented by cutting the catgut ligatures long and allowing the ends to protrude below between the sutures, thus acting as a drain. This same procedure is repeated in not more than two other places, when the development of the hemorrhoids is most pronounced. At the conclusion of the operation a dressing of sterile gauze is placed over the suture lines, a large tube surrounded by iodoform gauze

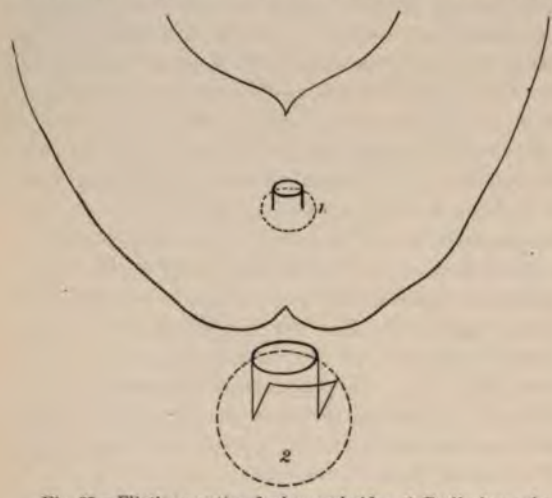


Fig. 27.—Eliot's operation for hemorrhoids: *1*, Preliminary incision; *2*, incision magnified, heavy lines represent cut surfaces (Eliot, in Med. News, Dec. 1, 1900).

Fig. 28.—Eliot's operation for hemorrhoids: *1*, Showing hemorrhoid, dotted line of first incision; *2*, first incision completed, second incision, dotted line; *3*, second incision completed; *4*, hemorrhoid cut away, surface ready for suture (Eliot, in Med. News, Dec. 1, 1900).

having previously been introduced upward into the lumen of the gut to facilitate the exit of any gas or of accumulated fecal material. By this method prompt union is usually secured. Sloughing is unlikely, as the vascularity of the flap is most abundant. Should healing take place by granulation, each resulting cicatrix would be separated by a bridge of healthy mucous membrane, which would effectually prevent the development of subsequent contraction and stenosis. Another advantage is that it permits excision of all areas of ulceration, thus lessening the possibility of infection. If the entire anal orifice is involved, the intervening hemorrhoidal tissue would rapidly shrink, except in the most advanced cases, as a result of the ecstatic condition of the sphincter and the excision of the intervening vessels.

B. Merrill Ricketts [1] read before the American Proctological Society, May, 1900, a paper on the **submucous ligature for hemorrhoids.** A large needle armed with moderate-sized kangaroo-tendon is passed submucously halfway round the hemorrhoid and made to emerge; it is then reinserted at the point of exit and passes out at the point of primary entrance. As many of these ligatures may be inserted as are

Fig. 29.—Hawkins' pile and pedicle clamp (Hawkins, in Am. Med., June 1, 1901).

necessary. Sometimes it is more convenient to introduce all the ligatures before tightening any of them. It may be necessary to puncture some of the larger hemorrhoids. The advantages claimed are: (1) the impossibility of secondary hemorrhage; (2) no tissue destroyed; (3) no infection.

John A. Hawkins [2] discusses the various operative procedures for the relief of **hemorrhoids** and describes a **new method of excision.** He uses a long, thin-bladed, tongue-and-grooved forceps. The base of the pile is clamped with these forceps and cut off close to the blades. A suture of catgut is inserted above the tip of the clamp and continued down to the shank surrounding the forceps in a spiral manner, so that when the clamp is removed the edges of the stump are approximated by drawing on each end of the suture. There is no hemorrhage and very little pain.

F. C. Wallis [3] writes on **nonmalignant stricture of the rectum,** which, he says, is invariably the sequel of preexisting ulceration unless

[1] Med. Rec., July 21, 1900. [2] Am. Med., June 1, 1901.
[3] Brit. Med. Jour., Oct. 6, 1900.

it be congenital. The causes are commonly said to be syphilis, tubercle, and dysentery, and slight attention is usually paid to obstetric trauma and operations as a cause of stricture. Halsted says one-third of all cases are syphilitic, and Julius Burger states that in 100 cases 66 were due to syphilis. Wallis refutes these statements. Stricture occurs three times in women to one in men. It occurs in the majority of cases at about the age of 30, when gummatous deposits are infrequent. No other signs of syphilis are in evidence, and antispecific treatment is absolutely useless. Syphilis will account for comparatively few strictures. The author believes all cases of ulceration and stricture which could not be definitely accounted for in any other way have been attributed to syphilis, thus giving birth to an erroneous belief among surgeons. It is extremely doubtful whether dysentery ever causes stricture. After the American rebellion not a single case among the soldiers could be attributed to dysentery. Tuberculous ulceration is a rare cause and is often extensive when it does occur. The most common cause, the writer holds, is septic ulceration following operation, labor, or external infection of an abrasion. A clinical feature of some importance in these cases is the occurrence of attacks of acute synovitis, which contributes to fixing the cause on the septic origin of the local ulceration. Cases are cited to support the views herein stated. The various procedures for the mitigation or cure of stricture are very inadequate. Bougies are harassing and not devoid of danger. Posterior proctotomy gives but temporary relief. Two cases are reported in which the strictured area existing high in the rectum was excised and the proximal segment of bowel united to the anal skin. The peritoneum was freely opened and later sutured. A preliminary inguinal colostomy is desirable. The operation is tedious and hemorrhage extensive. Although perineal excision has been advocated by Dieffenbach, Volkmann, and VanHook, no records of operations as extensive as the above have been found. The results were entirely satisfactory.

Dr. S. G. Gant [1] describes a case of **rectal stricture caused by stone in the bladder.** For some time before examination the patient had passed all urine through the rectum. The caliber of the bowel was obstructed by a hard, oval, movable tumor about the size of a hen's egg. The bladder was opened by a transverse perineal incision, and after much difficulty a stone weighing 4½ ounces was extracted. After operation the urine flowed through the perineal wound for 1 year, when the fistula closed.

F. Schneider [2] analyzes 115 cases of **rectal carcinoma** operated upon from 1883 to 1899. Sixty-six were in males and 49 in females. The average age for males was 59, for females 55 years. One case occurred during the fourteenth year, 1 during the fifteenth, and 2 during the seventeenth. Kocher's operation is employed in cancers just within the anus which are not adherent; the Kraske method is adopted when the growth is large and adherent to the sacrum. If the carcinoma is lateral, nonadherent, and does not extend higher than 8 or 10 centi-

[1] N. Y. Med. Jour., vol. LXXII, p. 59. [2] Beitr. z. klin. Chir., Bd. XXVI, H. 2.

meters above the anus, it is removed without sacrificing any bony tissue. When the uterus or bladder is involved, the case may be regarded as inoperable. Of 20 operations without bone resection, 13 patients died after 1 year and 10 months; 2 perished from the operation; 3 escaped incontinence; 7 lived beyond 3 years, and of these, 2 survived 9 years. Of 12 subjected to Kocher's operation, 4 died from operation. All had incontinence. One lived 3 and another 6 years. Of 17 Kraske operations, 4 patients died from operation, 7 after 1 year, and 5 survive after 1 year. Of 4 treated by the Schlange temporary bone resection method, but 1 lived 3 years. There were no deaths from the operation. The average duration of life of 32 patients treated by colostomy was 8 months; of 28 treated by palliation, 13 months. The mortality of the 31 subjected to bone resection was 23%; 45% died in 1 year and 58% in 2 years. With more experience, and consequently greater skill, this mortality should be greatly decreased, as Kraske has decreased his mortality from 40% in his first 10 cases to 9.8% in 51 cases.

M. Rheinwald [1] describes a method for the **removal of rectal carcinomas by invagination and ligature** devised by Steinthal. The method is applicable to freely movable growths only. The mass is pulled upon and invaginated into the rectum and an elastic ligature applied in the normal bowel above, the growth separating by sloughing. Of 2 cases thus treated, there has been no return of growth in 2½ and 4 years respectively. The advantages are brief anesthetization, almost complete hemostasis, and no fear of distributing cancer-cells. The one danger is that of including a coil of gut which may have prolapsed within the ligatured area, which may be annulled if the abdomen be previously opened, the mesorectum divided, and the gut then invaginated according to the advice of Trendelenburg.

W. M. A. Anderson [2] reports a case of **foreign body in the rectum.** The foreign body was a brilliantine bottle with a concave bottom, which acted as a sucker, and so prevented removal until a finger could be forced between the rectal mucous membrane and the bottom of the bottle.

Otto G. Ramsay [3] records the case of a woman with a **pin embedded in the rectum.** She had complained of pain, tenesmus, and some bleeding for 2 weeks. Examination revealed a pin about 1.5 centimeters within the anus. The point was free and the head embedded in the wall of the gut. It was extracted with forceps. The patient could not explain its presence.

Chas. A. Morton [4] describes a **method of ventrofixation of the sigmoid flexure for prolapse of the rectum,** which he has employed in one case with success. The abdomen was opened by the intramuscular method and the sigmoid pulled upon until the prolapse disappeared. The lowest part of the mesosigmoid was now stitched with fine silk to the parietal peritoneum. This the author considers to be safer and surer than passing the sutures through either the bowel-wall or the appendices epiploicæ.

[1] Beitr. z. klin. Chir., Bd. XXV, H. 3.
[2] Brit. Med. Jour., Mar. 9, 1901.
[3] Johns Hopkins Bull., Oct., 1900.
[4] Brit. Med. Jour., Apr. 13, 1901.

G. R. Fowler [1] describes an **improved technic in amputation of a large rectal prolapse.** Analgesia was effected by means of spinal cocainization and the patient placed in the combined lithotomy and Trendelenburg posture. A row of fenestrated forceps was placed just in front of the junction of the mucous membrane, with the skin of the anus in such a manner as to pinch up a circular fold of mucous membrane of the outer cylinder for the entire circumference of the gut. About half an inch in front of this an incision was made through the mucous membrane for the entire circumference of the bowel. The proximal flap was dissected back half an inch. The left index finger was now inserted in the inner cylinder and the prolapse amputated in the following manner: A transverse incision was made for half an inch, going directly down on the left index finger. The two proximal segments of bowel were then sutured. This was repeated until the entire circumference was traversed, save that each subsequent suture was applied before extending the incision. The dissected-back mucous membrane at the mucocutaneous margin was now sewed over the first layer of sutures. The advantages of this method consist (1) in the use of the combined lithotomy and Trendelenburg position, in order to prevent the descent of the small intestine during the operation, and thus providing against injury to it during the suturing; (2) in turning back a cuff at the mucocutaneous margin for the purpose of preserving the normal conditions at the rectal outlet, and at the same time permitting the removal of all the relaxed and overstretched mucous and submucous structures at this point. This cuff also provides a covering for the sutured edges of the stump of the prolapse and diminishes opportunities for subsequent infection; (3) in the step-by-step application of, first, a suture and then an extension of the incision through both cylinders to correspond with the sutured area, in this manner avoiding exposure of the peritoneal cavity to infection.

Gerard Marchant [2] advocates the theory that **rectal prolapse** occurs as a result of the yielding of the wall at the rectovesical culdesac from pressure of the small intestines in the Douglas pouch; by constipation; and probably by a congenital malformation of the culdesac. First the anterior wall prolapses and finally drags down the lateral and posterior walls. Treatment should consist in shortening and narrowing the prolapsed bowel and fixing it to some firm structure. The Marchant operation, or rectococcypexy, narrows the anus by excising a segment of its circumference, lessens the diameters of the bowel by folding it both longitudinally and transversely, and sutures it to the posterior pelvic wall.

J. M. Mathews, [3] in a paper on the **treatment of prolapse of the rectum,** read before the Chicago Medical Society, says he has yet to see a case incident to young life that has not readily yielded to the following simple plan of treatment: Administration of a gentle purgative, and

[1] Med. News, Dec. 8, 1900.
[2] Bull. et Mém. de la Soc. de Chir. de Paris, Apr. 17, 1900.
[3] Jour. Am. Med. Assoc., Mar. 30, 1901.

when it acts the protruded gut is washed with cold water and returned. Then the buttocks are strapped closely together with adhesive plaster, which is allowed to remain 4 or 5 days, the child remaining in bed and taking liquid diet. The plaster is now removed and the bowels moved by castor oil and an enema of cold water. This procedure is repeated. The child is then allowed to have bowel movement either in the erect posture or lying down. The application of caustics is deprecated. Linear cauterization is said to be too severe for mild cases and useless in the severer forms. The cutting out of an elliptic piece of gut and drawing it together with sutures is unsatisfactory. There are formidable objections to the amputation of the prolapse unless it be mucous membrane only. Mathews believes colopexia in cases of the second or third degree to be the operation of choice. He describes a very severe case in an adult, in which he obtained an excellent result by suturing the bowel to the abdominal wall. This prolapse was as large in circumference as a No. 7 Derby hat, and contained, in addition to the rectum and peritoneum, the bladder. At the time this operation was done—April, 1899—it was believed to be original. The operation described by Jaennel in 1889, fixing the colon to an artificial anus in the iliac region, Mathews says is unnecessary and unjustifiable.

Charles B. Kelsey [1] reports a case of **imperforate anus** in which the rectum opened into the urethra. Shortly after birth a perineal anus was made. The patient is now 24 years of age and has frequently gone 3 months without a fecal evacuation of any sort. An artificial anus was made at the junction of the transverse and descending colon, the latter having been transformed into an immense pouch.

J. Rawson Pennington [2] read before the Section on Surgery and Anatomy, at the fifty-first annual meeting of the American Medical Association, June, 1900, a paper on **new points in the anatomy and histology of the rectum and colon.** He says the rectum begins where the mesocolon ends—at about the third sacral vertebra. The sigmoid has two fixed points, its beginning fastened to the ileum, and its ending anchored to the third sacral vertebra. Its position varies according to its length, the length of its mesentery, its degree of distention, and according to the condition of the surrounding viscera. The collapsed sigmoid usually occupies the left iliac fossa, but as it distends it extends toward and often into the right iliac fossa, frequently above the umbilicus, and sometimes to the diaphragm. Near the junction of the rectum and sigmoid the mesenteric fibers are frequently thrown across the posterior or lateral surface of the rectum and the right side of the pelvic brim in such a manner as to hold more securely the feet of the flexure in relation to each other. The rectum is divided into apartments by partitions (Houston's valves) extending across it. Kohlrausch, Otis, and Martin have corroborated Houston's discoveries; Bodenhammer, Kelsey, and Mathews deny the existence of valves; and Allingham, Cripps, and Ball ignore them. The number, location, size, position, direction, capacity, and structure of these valves vary. As a

[1] Phila. Med. Jour., May 18, 1901. [2] Jour. Am. Med. Assoc., Dec. 15, 1900.

rule, there are three, usually semilunar, attached to from one-half to two-thirds of the circumference of the bowel. Their margins are concave and usually directed slightly upward; are most prominent when bowel is distended; and their depth is from ½ to 1 inch or more. The first or lowermost is situated on the left, about opposite the sacrococcygeal joint; the uppermost is at the upper end of the rectum on the left, and the second or middle one is on the right side at about the junction of the middle and lower third of the rectum. Tortuosity of the sigmoid with hyperplasia, irregularity, and deformity of the rectal valves are frequently the primitive causes of obstinate **constipation.** The diagnosis of valvular obstruction is made by inspection with a tubular speculum. If the valves be hypertrophied or stiffened, they will interfere with defecation. The elasticity is tested with an angular hook; a healthy valve is readily effaced. The author has used the cautery, knife, and scissors on pathologic valves, and has had one case of peritonitis and one of alarming hemorrhage following the cutting operation, although much relief has been given. Pennington has devised an automatic valve clip, made

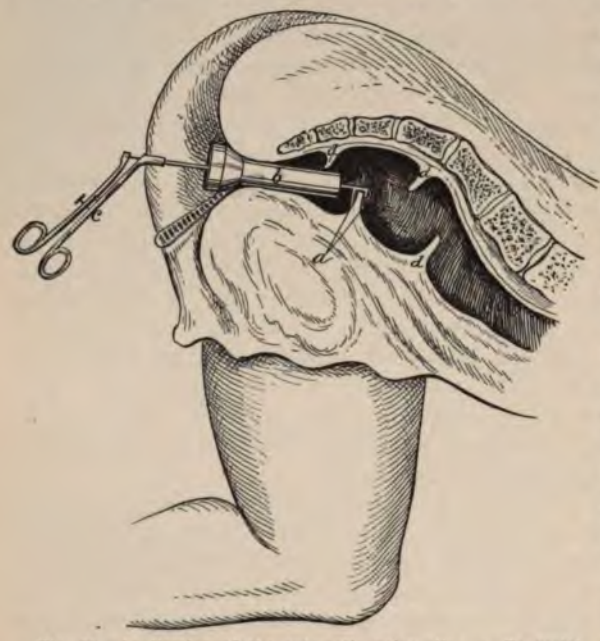


Fig. 30.—Application of the automatic valve clip: *a*, To rectal valve; *b* is the speculum; *c*, the clip applicator; *d*, the rectal valves (Pennington, in Jour. Am. Med. Assoc., Dec. 15, 1900).

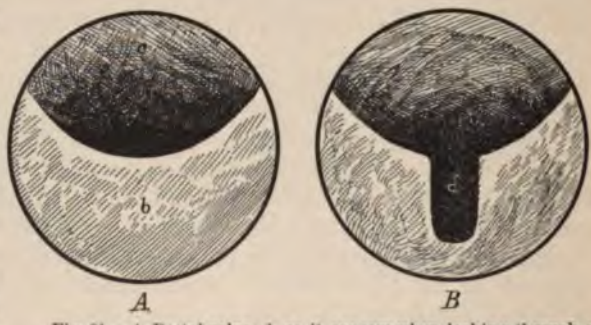


Fig. 31.—*A*, Rectal valve: *b*, as it appears when looking through a tubular speculum, with the patient in the proctoscopic posture; *c*, the lumen of the bowel as seen above the free border of the valve. *B*, Appearance of valve after a section (*d*) has been removed with the clip by pressure necrosis (Pennington, in Jour. Am. Med. Assoc., Dec. 15, 1900).

of spring steel and consisting of a permanent and movable plate. To apply the clip the patient is placed in the proctoscopic posture, a tubular speculum introduced, and the clip on a clip-introducer applied to the structure to be divided. The clip is retained by its spring and automatic action. The section grasped is destroyed and removed by pressure necrosis, leaving a permanent division of the valve.

APPENDICITIS.

Miles F. Porter [1] read a paper before the American Medical Association on **colitis, constipation, and appendicitis: their etiologic relations,** with a consideration of the value of incision and drainage in certain forms of appendicitis. The author argues that constipation resulting in colitis is a very common cause of appendicitis and reports a number of cases in support of his argument. He says that the majority of cases occur in childhood and that enterocolitis and colitis are most frequent in the young. In discussing the question of removing the appendix in every case of appendicitis, it is said that the greater skill possessed by some surgeons will enable them to remove the appendix in certain cases of abscess, whereas its removal when undertaken by one less experienced would probably result in death to the patient. There are also a number of cases which will stand the simple incision and drainage, but which would die if subjected to the more serious operation. It is thought that the surgeon who holds to the rule that the appendix should be removed in every case is more likely to reject operation in desperate cases than he who does not hold this radical view. It is undoubtedly true that a number of recurrences take place after simple drainage, but it is a great question whether these cases would have resulted in recovery had the adhesions been broken up, the appendix searched for and removed. Through a correspondence with 14 operators in this country, the author has been able to collect 177 cases of appendicitis treated by incision and drainage. To these he adds 25 of his own, making in all 202 cases. In these there was a recurrence in 13 %, the period of recurrence varying from 2 weeks to 21 years. In his own 25 cases there has been but 1 recurrence, and that after 4 years. The author's paper was very generally discussed. Nicholas Senn said that it was undoubtedly true that more cases of fistula followed the drainage operation than occurs when the appendix is removed. Senn thinks that 80 % of all cases of appendicitis will recover and that not more than one-half of them will ever suffer a second attack. He assumes a most conservative attitude concerning operation in appendicitis. Dawbarn said that he believed the same discussion which was now taking place would occur in the Society's meetings 25 years hence. He spoke of his method of preventing fistula in cases of gangrene of the cecum. The gangrenous portion is surrounded by purse-string running suture, which when tied inverts the gangrenous portion, which in time sloughs away and passes

[1] Jour. Am. Med. Assoc., Dec. 15, 1900.

off through the bowel. Mynter said that in his own practice only 5% of recurrences took place after incision and drainage. He agrees with Deaver entirely as regards early operation, but does not hold the same attitude regarding the removal of the appendix in every case. He also disagrees with Deaver regarding the frequency of fistula after the drainage method. He much prefers Deaver's position to that of Senn. Keen is not prepared to agree with Senn and yet thinks that a great many cases recover from the first attack. He does not think that any case should be allowed to pass beyond two attacks, since statistics show that recurrences after the second attack are most likely to occur. In deciding this question the surgeon as well as the particular case must be taken into consideration, since it may be permissible in a certain case for a man of much experience and of great skill to undertake a more radical operation than one of less experience and operative skill. He thinks it is rare that a fistula occurs which will not heal spontaneously. McRae places the percentage of recurrences for simple drainage much higher than does Porter, but thinks that certain cases require drainage and nothing more. Murphy thinks that fistulas would be much less frequent if cases were submitted to operation earlier. He makes it a rule to operate upon every case except those which are moribund. Rufus B. Hall thought that it was a mistake not to operate upon the desperate cases, since occasionally one may be saved. If a case recovers from a primary attack, radical operation should be advised during the interval. Fenger teaches that if the symptoms improve after the diagnosis is made, no operation is indicated; but that if the patient grows worse, an immediate operation must be done. Ashton agrees absolutely with the position taken by Dr. Deaver. Ochsner, in 248 cases of appendicitis, employed incision and drainage only in 4%. With increasing experience and skill the surgeon will find that he will remove more appendices each year. The treatment must be based not only on the patient's condition, but also upon the operative skill of the surgeon. He refers to a plan of treatment which has made a wonderful change in his mortality-rate. It consists in the absolute and complete prohibition of food and cathartics by the mouth; the washing out of the stomach; and of depending entirely upon rectal alimentation. This treatment prevents or limits peristalsis, which if allowed to go on unchecked tends to increase the inflammation in the appendix region. Dr. Deaver said that he operated in all cases as soon as the diagnosis was made, and that waiting for symptoms to improve or grow worse, he thought, cost many lives. [We are in agreement with Porter as to the removal of the appendix in abscess cases. We are sure that one who operates frequently and has in consequence become peculiarly skilful can remove an appendix when a less accomplished operator would fail. We are also sure that the occasional operator should content himself with incision and drainage. We are persuaded that in many cases no surgeon, however skilful, should try to dig out the appendix because of the great peril of the undertaking. Although a fecal fistula may follow simple drainage or in about 10% of cases another attack of inflammation may

occur, we believe that such misfortunes are uncommon and usually remediable, and that the very cases in which they occur might have perished from more radical surgery.]

In his address before the New York Academy of Medicine, Robert Abbe [1] discussed the question of **appendicitis from the medical and surgical points of view.** He showed a great number of specimens which had been preserved in alcohol. His method of preservation of the specimens consists in distending the cavity of the appendix with alcohol and then allowing the structure to harden in alcohol. After hardening has taken place, he splits the organ open. This method preserves the appendix in the condition in which it was at the time of removal. In nearly every instance a number of strictures are found in the interior of the appendix, and frequently one or more concretions. The appendices showing strictures without calculi were those removed from patients suffering from chronic dyspepsia and invalidism. Those specimens which contained concretions were mostly removed in an acute attack, but many of them were found at the interval operations. The secretion of the appendix accumulates behind the stricture, producing great distention and giving rise to all the symptoms of an acute attack. Occasionally the obstruction is overcome, the contents of the appendix are emptied into the cecum, and the patient recovers from the attack. Obliterative appendicitis results from the shedding of the epithelium and a subsequent sealing of the opposing walls of the appendix. A partial obliteration of the appendix is quite common, and such an event makes the patient much worse off than before. A completely obliterated cavity may leave an atrophied appendix which becomes the seat of disabling neuralgia. Abbe exhibited another series of specimens which showed only small follicular ulcerations of the mucous membrane. This class of cases is usually accompanied by a slight septic fever. The healing of these ulcers frequently results in the formation of stricture. Abbe shows that strictures of the appendix are of slow formation, often requiring years before they completely obstruct the channel. Not infrequently cases are met with in which a concretion is found behind a stricture which was the result of a catarrhal or ulcerative appendicitis which had taken place many years previously. Concretions always form slowly and are invariably found on the distal side of the stricture. They vary in hardness according to their age. Food products rarely enter into their composition. Desquamated epithelium is always found together with numerous bacteria. Calcareous incrustations may be met with and needle-like crystals are frequently found. Abbe regrets that some recent writers still hold to the theory that the concretions form in the colon and drop into the appendix. The fact that the concretion is always beyond the stricture shows such an attitude to be an erroneous one. The author asserts that the stone does not begin to form until the stricture is so narrow that the exfoliated epithelium can no longer be passed into the colon. In no case has he found concretions in the appendix unless a very tight stricture retained them. Abbe thinks that

[1] Med. Rec., Feb. 16, 1901.

attacks of acute influenza produce catarrhal appendicitis which results in stricture and subsequent formation of concretions. The author asserts that it is only by examining specimens at the time of removal or after they have been properly preserved that the medical practitioner can be made to understand the surgeon's attitude toward the operative treatment of these conditions. Abbe prefers to use the word "latent" instead of "chronic" in regard to cases in which there are repeated attacks. He describes also the various conditions found outside of the appendix at the time of operation. In referring to the statistics of cases cured by medicinal treatment, he shows the fallacy of considering a patient cured because he recovers from an attack, since such a person is very apt to be left with some pathologic condition within the organ which in the majority of instances will give rise to subsequent trouble. One specimen which he showed represented the appendix opening at two points into the intestine where it had discharged numerous calculi. It is said that the feeling is growing among experienced surgeons that cases of appendicitis should be operated upon when first recognized. Reference is made to the advantage of a leukocyte-count in differentiating appendicitis from other conditions, particularly typhoid fever in its early stages. The author alludes to those cases of profound pyemia in which a patient after 24 hours of appendix disturbance develops a chill which is followed by grave symptoms. In these cases there is usually a septic phlebitis of the large veins adjacent to the appendix and a condition of peritoneal anesthesia which masks the symptoms. Abbe closes his paper by saying: "I have shown that inflammatory strictures are almost universally present, the foundation and cause of the subsequent disease; that while they are uniformly of slow growth, the real mischief does not begin until occlusion occurs; that attacks are often cured by natural method; that a long respite does not mean a cure; that it is impossible to predicate a cure; that, unless the appendix is out, the disease is always 'latent,' when once it has begun."

Howard Kelly [1] discusses the question of **how to deal with the vermiform appendix in certain cases of complicated appendicitis.** He says that he long ago discovered that when the appendix is densely adherent at its tip the best way to remove it is to divide it at its proximal end, invert the stump, and then separate the adhesions from the rest of the organ. During this manipulation the cut end of the appendix should be wrapped in a piece of gauze so as to prevent contamination. It is much easier to separate the adhesions when one end of the appendix is free. This practice is a particular advantage in the female pelvis, where the appendix is frequently adherent to a pyosalpinx or an ovarian or fibroid tumor. Occasionally the appendix is found embedded in strong old adhesions, the tearing or cutting of which involves considerable bleeding. In such cases, in the absence of an abscess or perforation, Kelly has found it a good plan to divide the peritoneal and external muscular coats by a circular incision, and then to strip out the appendix, leaving behind these two external coats. With a little care

[1] Am. Med., Apr. 20, 1901.

this can usually be accomplished and little bleeding result. [The suggestion of Kelly, that in certain cases in which there are dense adhesions the mucous tube of the diverticulum should be stripped out from the other coats, is extremely valuable, and we have found it practically useful.]

A discussion on the subject of appendicitis [1] was held at the Harvard Medical Society of New York City. The discussion was opened by Dr. Ramon Guiteras, who read a paper on **suppurative appendicitis.** Guiteras said that if pain and tenderness are not severe, the temperature not high, and the pulse reasonably good, cold may be applied for the first 24 hours. If the symptoms improve, the patient may be considered over the disease for the time being. If the disturbance of pulse and temperature keep up for 3 or 4 days, the probability is that pus is present. The size of a tumor is not necessarily in proportion to the severity of the symptoms nor to the duration of the disease. The sudden disappearance of the tumor is nearly always a bad sign, although such disappearance is usually accompanied by a sense of relief. Of course, it sometimes happens that rupture takes place into a neighboring viscus, but it is much easier for the abscess to open into the peritoneal cavity. The author thinks the appendix should be removed in every case possible, but that when adhesions are such that to break them up means the possible infection of the peritoneal cavity, it is better simply to incise and drain, removing the appendix at a later period. Egbert H. Grandin asserted that the less done after the opening of the abscess and the establishing of drainage, the better for the patient. Counter-drainage is frequently indicated and may be made through the loin, or through the vagina in women. Wm. B. Coley believes that the removal of the appendix in every case is good surgery in skilful hands, but that it is a dangerous procedure to be adopted by all operators. Another important point to be considered in regard to the removal of the appendix in cases of abscess is the condition of the patient. Often the patient is in no condition to withstand either the prolongation of the operation or the manipulation necessary for the complete removal of the appendix. It is said by some that when an incision is made and drainage is secured, the appendix subsequently sloughs off in many cases. Coley cites a case, however, in which it was said that the appendix had sloughed away and yet a second attack of appendicitis occurred. Theodore Dunham has found the iodin test for pus to be of advantage often when the leukocyte-count was not sufficiently high to make a diagnosis of suppuration. Potter has studied the leukocyte-count in 80 cases of chronic appendicitis, and decides that a leukocytosis is not pathognomonic, but is of considerable aid to diagnosis in many cases. [We believe that marked leukocytosis is often a valuable aid. In cases in which general peritonitis exists and the individual is overwhelmed and fails to react there may be no leukocytosis. That the appendix sometimes sloughs is certain. In a reoperation for a fecal fistula the fistula was discovered in the front of the colon some distance from the site of appendix, and

[1] Med. News, Mar. 2, 1901.

the appendix was found to have sloughed to a small solid lump marking its site.]

J. Henry Barbat,[1] in discussing the **symptoms of appendicitis,** says that in 90% of all cases nausea and vomiting are present. The symptoms of greatest value in making a diagnosis are sudden pain in the abdomen, nausea or vomiting, and localized tenderness. The author thinks that many mistakes are made in diagnosis because the attendant fails to consider or give sufficient weight to the mode of onset of the illness. In showing that the pulse and temperature are of little value in this condition he reports 3 cases, the first patient having had a normal temperature and pulse and yet there was removed an appendix with its distal end filled with pus and undergoing gangrene. The second patient, with a normal pulse and temperature, presented an appendix containing 5 appendoliths. In the third patient an extremely large appendix was removed containing a very large appendolith. In this case also the pulse and temperature were not increased. Barbat thinks that the physical signs or subjective symptoms are no index to the pathologic condition present, since we find the most desperate conditions with the mildest symptoms, and vice versa. This want of adjustment between symptoms and conditions which is sometimes present in severe cases is explained by the fact that when gangrene is present anesthesia is produced. The bursting of an appendix will give relief to symptoms which were marked while the organ was distended. The nausea is reflex, is sometimes marked in the mild cases, and often altogether absent in the severe ones. The increase of temperature and pulse is due to ptomain absorption. In gangrene of the appendix little absorption takes place and consequently there is frequently no fever. On the other hand, a slight ulceration of the mucous membrane of the appendix permits free absorption, and in such cases we are apt to have a high temperature. When symptoms are marked in the beginning of an attack, operation should be advised during the first few hours. Barbat concludes his paper as follows: (1) That over 90% of cases of true appendicitis which are not operated on have recurrences. (2) That we should operate in all cases of chronic recurrent appendicitis, if possible between attacks. (3) That in practically all patients who die after operation we find at least 48 hours between the onset of the attack and the time of operation; therefore it is reasonable to assume that if these patients had been operated upon inside of the 48 hours, they would have been cured. (4) That as soon as a diagnosis of acute appendicitis is made, operate immediately. (5) Pulse and temperature are not to be taken into consideration in making a diagnosis of appendicitis. (6) In acute cases the diagnosis must be based on the symptoms which were manifested during the first 3 or 4 hours.

Paul Klemm,[2] in speaking of the **treatment of appendicitis,** says that acute catarrhal appendicitis should be given conservative treatment and that operation is to be done only when urgently indicated. After

[1] Jour. Am. Med. Assoc., Oct. 27, 1901.
[2] St. Petersburg med. Woch., Dec. 1, 1900.

recovery from an acute catarrhal attack operation should be advised. Operation should also be done in cases running a chronic course even if there has been no acute attack. When simple incision and drainage have been resorted to and the patient recovers, the appendix should not then be removed unless a relapse occurs, since not infrequently atrophy of the appendix takes place.

Byron Robinson [1] has investigated the **relation of the appendix to the psoas muscle** in 300 male and 118 female adult autopsies. The author goes very carefully into the consideration of the topographic anatomy of the appendix and cecum, and presents many interesting and instructive illustrations. The appendix was so frequently found adherent to the psoas muscle, and was so seldom adherent when situated elsewhere, that he is inclined to think that trauma of the psoas muscle is most productive of appendicitis. Because of its vascular, nervous, and lymphatic supply the appendix is considered the weakest segment of the intestinal canal.

Samuel Lloyd,[2] after a rather general discussion of the subject of **appendicitis,** in speaking of the treatment of suppurative appendicitis, says that it is his custom to irrigate every abscess thoroughly with hydrogen dioxid. In general peritonitis he has used as much as 4 pint bottles of dioxid. The dioxid was followed by hot normal salt solution. The author thinks he has saved patients by this treatment who would otherwise have died. [This method has been warmly advocated by Morris of New York, and we have used it with satisfaction.]

J. H. Carstens,[3] in relating some **facts about appendicitis,** devotes considerable space to a discussion of the comparative merits of medicinal and surgical treatment. He thinks that every case should be operated upon, but he does not mean by this that due consideration should not be given to the condition of the patient and his environment. Operation should always be advised after a second attack even though it be mild. The author deplores the habit of waiting for adhesions to form or for improvement to take place in well-marked cases. He thinks that it is a mistake to operate upon cases of appendicitis under unpromising circumstances and when the patient cannot receive the proper after-treatment. Many successful cases are reported that have been operated upon under these circumstances, but many others never alluded to have died. When there is a mixed infection of Bacillus coli and Staphylococcus pyogenes aureus, the attack is accompanied by considerable fever. Carstens has met with cases in which the appendix has not been ruptured and yet the peritoneal cavity has been found to contain Staphylococcus albus. He expresses the opinion that the variety of microorganism has little to do with the severity of the symptoms. Not infrequently an appendix is removed between attacks which presents macroscopically no evidence of disease, and yet when examined with the microscope shows the mucous membrane to be ulcerated and frequently strictured. The best proof, however, that the

[1] Ann. of Surg., Apr., 1900. [2] Phila. Med. Jour., Sept. 29, 1901.
[3] Jour. Am. Med. Assoc., Sept. 15, 1900.

operation is indicated in these cases is the fact that the patients recover their former health after operation. In speaking of the mortality under medicinal and surgical treatment, Carstens has the following to say: "I looked over the death record of the city of Detroit for 1899 and I found that 37 deaths are put down as having resulted from appendicitis. There are 54 put down as due to peritonitis, and though some of the latter deaths may be due to pelvic diseases, I am sure that more than half are due to appendicitis, treated with poultices and opium, and finally disposed of with a pious exclamation: 'The Lord's will be done.' The death records of these 37 patients were signed by 19 different physicians, and I thought that by inquiring from them I might be able to arrive at some kind of conclusion. I received answers from 12, who reported on 25 deaths. Fourteen of these patients had been subjected to operation and eleven others died without any operative interference. As the members of the medical profession who had signed these certificates had been able to properly diagnosticate the cases, and were first-class men in good standing, I thought I might also get further information from them, and asked them to give me the number of cases they had had during the year, and how many patients died with or without an operation. I received reports of 213 cases of appendicitis. Of these 160 were operated on during the acute attack or during the interval; in fact, at any time when the surgeon thought it was proper. Of these 160 cases, 14 patients died. This list of surgical cases includes naturally the reports of the principal surgeons and gives a death-rate of about 8%, counting everything—easy interval cases, severe cases, purulent peritonitis, and those actually moribund. The number of cases not operated on—that is, medicinally treated, was 57, with 11 deaths, giving a mortality of over 20%. From the reports of the physicians in nearly every case, the operation had been urged, but refused by the parents of the patient, or by the patient himself." His conclusions are: "(1) It ought to be a general rule that every case of appendicitis should be operated on as soon as the diagnosis is made; but when it is the first attack and very mild, or no proper facilities are at hand either to perform the operation or to take care of the patient afterward, it is often good policy to wait and watch the case. (2) In cases of second or subsequent attacks, however, the patient should be sent to a hospital, even though it is at quite a distance—unless good facilities can be had at home—and an operation promptly performed. (3) Statistics of cases operated on as they come along,—good, bad, and indifferent,—by experienced surgeons, give a mortality of only 8%. (4) Statistics collected by general practitioners who are able and up to date, and who advocate surgical interference, show that medicinally treated cases have a death-rate of at least 15% to 20%; that at least 60% have recurrences; while the patients operated on are absolutely cured." [We do not believe that the variety of organism present bears any relation to the severity of the symptoms. Our experience is that streptococci infections are peculiarly virulent and have a notable disposition to spread.]

In discussing the question of **appendicular fistula** Deaver [1] divides fistulas of appendicular origin into external and internal. The external fistulas are divided into the simple and fecal. The simple fistula may be connected only with an unhealed abscess-cavity and tends to heal spontaneously. It is usually due to an infected ligature or probably a piece of gauze in the wound. A simple fistula may also be in direct communication with the lumen of the appendix. In such instances the discharge is a clear mucus. In these cases the proximal end of the appendix has either been separated from the cecum or else obliterated. Fecal fistulas are also divided into two varieties—those in which the proximal end of the appendix is in direct communication with the fistula and those in which some portion of the intestinal tract opens directly into the fistula. Pus is not an essential factor in the production of a fistula, since pressure from a drainage-tube or the cutting out of stitches which have been placed in the bowel may also produce the condition. The persistence of a fecal fistula may be due to the continued use of the drainage-tube. The fistula may not make its appearance for a week or 10 days after operation. The internal type of fistula is the result of ulceration into a neighboring viscus. The most fortunate variety of internal fistula is that which breaks into the cecum or ascending colon. When rupture takes place into the small intestine, intestinal obstruction has frequently resulted from the slipping of a knuckle of bowel under the point of adhesion. Great stress is laid upon the prevention of fistulas by early operation. In the external variety it is wise to allow Nature to attempt a cure. A diet of solid food and maintaining a certain hardness of the bowel-contents will frequently aid the healing of a fecal fistula. It is unwise to syringe a fistulous tract. After the fistula has existed for a considerable time operation offers the only hope of cure. The extraction of a ligature or other foreign body will often result in healing. When the fistula communicates with an unhealed abscess-cavity, it should be dilated and the cavity thoroughly cleansed and packed. The treatment of a fecal fistula is much more complicated and not infrequently requires resection of the bowel.

J. F. Baldwin [2] reports 2 very interesting cases of **subphrenic abscess following appendicitis.** Each case had been operated upon and in each the appendix had been removed. A diagnosis of subphrenic abscess was made in each case and incision and drainage resulted in cure. Including his own, the author has been able to collect 45 cases. He thinks, however, that this complication is much more frequent than is generally supposed, because it is often undiagnosticated. Maydl has called attention to appendicitis as a frequent cause of subphrenic abscess. Baldwin refers to a case of appendicitis in which the abscess worked its way up behind the colon, perforated the diaphragm, and ruptured into the bronchial tubes. The patient made a good recovery. In many of the cases of subphrenic abscess the true nature of the condition was not discovered antemortem. It is frequently impossible to differentiate a subphrenic abscess from a liver abscess. Beck's estimate of the mortal-

[1] Jour. Am. Med. Assoc., July 14, 1900. [2] Med. News, July 14, 1900.

ity of this condition when no operation is done is 95%. Under surgical treatment Maydl says the mortality should not exceed 50%.

J. M. Elder [1] reports a case of a child 7 months old in which a **gangrenous and perforated appendix was found occupying the sac of a right inguinal hernia.** The patient made a satisfactory recovery.

Another case of **strangulated vermiform appendix found in a femoral hernia** in a woman aged 33 years is reported by Hemsted.[2]

Athelstan Saw [3] reports a case of appendicitis in which a **hair** was found to form the **nucleus of an appendicular concretion.** The patient was a young man of nervous temperament, who was in the habit of biting off the ends of his mustache, and it was thought that in this way the hair found its way into the appendix.

Intestinal worms as an etiologic factor in appendicitis are discussed editorially in the "Lancet" of March 23, 1900. The basis of the editorial is a communication made to the Paris Academy of Medicine, by Metchnikoff, of the Pasteur Institute. He reported 3 cases of appendicitis in which an examination of the feces demonstrated the presence of the ova of various parasites. Vermifuge treatment was instituted, the worms were passed, and the symptoms immediately disappeared. One of these patients had suffered from recurrent attacks of inflammation of the right iliac fossa for a number of years. The reports of Boeckel and Davaine, in which the coincidence of intestinal worms and appendicitis is mentioned, are referred to by the writer. Natale has reported a case of inguinal abscess which ruptured externally and gave forth 16 living ascarides. Brun and Guinard have both removed appendices containing parasites. It is thought wise to bear this cause of appendicitis in mind, and when it is suspected to institute proper vermifuge treatment.

Louis J. Ladinski [4] reports a most interesting case of **internal hemorrhage the result of traumatic rupture of recent adhesions due to acute appendicitis.** The patient was a boy 11 years old, who previous to his injury had complained of pain in the abdomen. This, however, was not sufficient to prevent him playing about. The patient fell over a balustrade and was immediately put to bed, suffering with severe pain in the abdomen and nausea and vomiting. Ladinski saw the boy 48 hours after the injury and found him suffering from all the symptoms of an acute peritonitis and in a condition of collapse. The abdomen was opened and found to be filled with blood. When this was cleaned away the appendix was discovered very much congested and quite adherent. At the bend of the mesoappendix there was a tear about ½ inch long in which were found several small actively bleeding vessels. The appendix was ligated and removed and the cavity irrigated with saline solution. The patient made a satisfactory recovery. The author has been able to find no report of a similar case.

Lymphatic and portal infections following appendicitis are

[1] Montreal Med. Jour., Mar., 1901.
[2] Brit. Med. Jour., Dec. 8, 1900.
[3] Brit. Med. Jour., Feb. 23, 1901.
[4] Med. Rec., Dec. 15, 1900.

discussed by J. C. Monro.[1] The author thinks that these conditions after appendicitis or accompanying the disease are not sufficiently understood by the general practitioner. When, after an operation for appendicitis in which good drainage has been established and maintained, there is a persistent elevation of temperature and no evidence of inflammation of the chest, kidneys, or pelvic organs, portal infection or inflammation of the retroperitoneal lymphatics should be considered. Whenever there is sepsis associated with hepatic tenderness, whether jaundice is present or not, the condition is probably one of portal phlebitis. Infection of the retroperitoneal glands is probably present to some extent in all cases of appendicitis. This infection of the lymphatics may not manifest itself until many months after an attack of appendicitis. Aspiration of the liver in suspected cases is not to be recommended, it being much safer and more satisfactory to approach the liver through an incision in the abdominal wall. The position the author takes regarding treatment is supported by a report of 8 cases of lymphatic involvement and 5 cases of portal infection after operations upon the appendix.

A. J. Ochsner[2] writes upon the **elimination of the diseased appendix from the general peritoneal cavity.** The basis of the author's paper is 248 cases operated upon in the Augustana Hospital, of which only 8 patients died. Six of the deaths occurred out of 12 cases of diffuse peritonitis which was present at the time of the patients' admission to the hospital; 148 operations were performed during the interval between attacks, and of these none died. Ochsner thinks that if patients are seen within the first 12 hours an immediate operation should be done. If, however, there has been an extension of the inflammation or abscess has formed, he pursues a different plan of treatment. The patient is kept absolutely quiet, all cathartics and food by the stomach are withheld, feeding being kept up by the rectum. The pursuit of this treatment prevents peristalsis and enables the omentum to form protecting adhesions about the inflamed area. In all of the cases in which this treatment was followed subsequent operation was done and the supposed intraperitoneal condition verified. Unless peristaltic motion is absolutely controlled the inflammation extends and the walling off of the abscess is prevented.

Robins[3] strongly recommends the employment of **blood counting** as a diagnostic measure **in cases of supposed appendicitis.** The blood-count is of particular advantage when appendicitis complicates an inflammatory or infectious disease, such as typhoid fever. A sudden hyperleukocytosis associated with severe pain in the abdomen during the course of typhoid fever would certainly justify an exploratory operation. Blood-count also enables us to differentiate between suppurative appendicitis and simple colic, typhoid fever, ovarian neuralgia, impaction of feces, and floating kidney. In many doubtful cases of appendicitis repeated examinations of the blood should be made. The author quotes the fol-

[1] Therap. Gaz., Jan. 15, 1901. [2] Chicago Med. Recorder, Nov., 1900.
[3] Med. Rec., Oct. 27, 1900.

lowing from Cabot's table to show the association between suppurative appendicitis and hyperleukocytosis: "No. 1, 52,000 leukocytes; pus found on operation. No. 2, 19,000 leukocytes; pocket of pus found. No. 15, 22,300 leukocytes; abdomen full of pus. No. 17, 21,900 leukocytes; pus; cecal abscess. No. 18, 47,700 leukocytes; second operation; pus. No. 18, 30,300 leukocytes; third operation; pus. No. 23, 20,000 leukocytes; operation; pus. No. 28, 19,000 leukocytes; purulent peritonitis. No. 31, 17,500 leukocytes; pint of pus. No. 34, 16,200 leukocytes; abscess cavity. No. 40, 32,800 leukocytes; large amount of pus. No. 50, 17,000 leukocytes; pus. No. 54, July 6th, 11,800 leukocytes; slight tenderness, no resistance or dullness. No. 54, July 7th, 19,000 leukocytes; resistance and tenderness; operation, pus. The last case shows how by means of a blood-count pus can be detected in 24 hours and a fatal case be thus converted into a very favorable one, and it appears rational, therefore, that a frequent blood-count in cases of appendicitis is almost an imperative necessity."

Rutherford Morison,[1] in writing upon the **diagnosis and treatment of abscess in connection with the vermiform appendix,** urges the necessity of localizing as far as possible the exact position of the abscess. Upon the situation of the pus is dependent both the treatment to be instituted and the prognosis of the case. In women the diagnosis of pelvic cases of appendicitis is frequently very difficult. Rectal or vaginal examination should be made in all cases of pelvic appendicitis. Morison thinks it safer to drain pelvic abscesses due to appendicitis through the rectum in men and through the vagina in women. When the operation is done intraperitoneally the author thinks the appendix should be removed in every case. If the abscess is adherent to the parietal peritoneum, the opening in the abdomen should be above the abscess in order to successfully wall off the rest of the abdominal cavity before opening into the abscess. In all his appendix work Morison employs catgut. Drainage when employed should always be placed at the posterior angle of the wound. Morison gives the mortality of appendicular abscess as 8% in all patients operated upon.

H. D. Rolleston[2] reports a case of **primary carcinoma of the vermiform appendix** occurring in a woman 26 years old. The patient had suffered from four attacks of appendicitis. During the last of these she was operated upon by Marmaduke Sheild. The appendix was easily removed being only slightly adherent at its tip to the fundus of the uterus. When the appendix was opened, a globular mass was found near the apex arising in the mucous membrane. It was somewhat caseous in appearance and suggested the possibility of tuberculous disease. The patient made a good recovery from the operation, but about 4 months later developed obscure abdominal pain with loss of flesh and secondary growths in the appendix region. An examination of the appendix showed the growth to be a primary spheroidal-celled carcinoma. "The facts that (1) the growth was most extensive in the mucous coat, (2) that it could be traced outward into the muscular coats, and (3) that

[1] Lancet, Feb. 23, 1901. [2] Lancet, July 7, 1900.

there was no growth on the peritoneum, showed that the growth originated in the mucous membrane of the appendix and that it was not a secondary growth either implanted in the peritoneum or arising as a result of embolism within its substance." The author refers to a number of cases which have been reported illustrating this rare situation of carcinoma. It is thought that this disease may be frequently overlooked because appendices removed are not systematically examined, and because of the rarity of clinical symptoms until some neighboring organ becomes involved. When symptoms are present they are those of appendicitis. Wright has reported a case in which perforation of the appendix occurred. Rolleston suggests the possibility of secondary carcinomatous nodules in the liver resulting from a primary carcinoma of the appendix.

T. R. C. Whipham [1] also reports a case of **primary carcinoma of the appendix.** This patient was not operated upon, but succumbed to the disease. The diagnosis of the nature of the growth was made at the necropsy. The carcinoma was of the spheroidal-cell variety and had its origin in the mucous membrane of the appendix.

Condamin and Voron [2] describe a condition which they designate a **pseudoappendix.** These cases usually occur in hysteric subjects or may be associated with secondary syphilis. If due to the latter condition, the symptoms result from a form of intestinal neuralgia which Fournier has called "syphilitic typhosis." In the hysteric cases swelling and fullness may be present, but there is an absence of depression, with general indications of abdominal disease. Even high temperature may be present in these cases. In the syphilitic cases pain is the principal symptom, but here there is an absolute freedom from general reaction. A differential diagnosis between true and false appendicitis is easily made if the possibility of the latter is kept in mind.

Robert T. Morris, in a letter to the "Medical Record," [3] referring to a death from the use of **hydrogen dioxid** occurring in the practice of another surgeon, defends the use of dioxid in cases of suppurative appendicitis. In such cases it is described as a "sheet anchor." In the case referred to it is shown that the dioxid was not properly employed. He is particular to call attention to the fact that this agent should not be used unless there is a free exit for the gas which is generated. [In the hands of experienced and careful surgeons we believe the use of hydrogen dioxid in cases of suppurative appendicitis to be perfectly safe, but we cannot feel that this agent should be recommended generally since there will be an occasional death from its improper use in the hands of the less experienced operators.]

Charles A. Wheaton [4] makes **fulminating appendicitis** the subject of his address before the Mississippi Valley Medical Association. Great stress is laid upon the fact that this is one form of appendicitis in which medicinal treatment can accomplish absolutely nothing, and that surgical treatment, when instituted early, may be the means of saving at least

[1] Lancet, Feb. 2, 1901.
[2] Arch. Prov. de Chir., May, 1900.
[3] Mar. 23, 1901.
[4] N. Y. Med. Jour., Nov. 3, 1900.

one-half of the patients. In this form of appendicitis the pulse and temperature are of importance, both being elevated. Following perforation of the appendix there is usually a subsidence of the pain and other symptoms which gives both the attending physician and the patient a false hope. Fulminating appendicitis, when considered statistically, should occupy an entirely different position from other forms of appendicitis. The author cites a number of cases in which it is shown that an early operation will result in a great saving of life. Especial attention is called to a cyanosis of the trunk, particularly of the abdominal region, which is the result of an apparent vasomotor paralysis. In cases of appendicitis in which this condition is present, together with a high temperature and high pulse, the attendant should at once suspect the malignancy of the attack.

John B. Deaver, [1] under the title "**walled off,**" discusses that form of **appendicitis** resulting in abscess which is **limited by adhesions.** The author condemns most heartily the practice of waiting for an abscess to become walled off in the general peritoneal cavity. He says that operation after abscess formation is most unsatisfactory, since oftentimes the appendix is not removed and subsequent attacks of appendicitis occur. He has never known a case in which the appendix has sloughed off after the cavity has been simply opened and drained. Abscess formation is preventable by an early operation, and Deaver says that those operators who have had the largest experience advocate early interference. Many patients have been lost by waiting, and not a single one, unless through faulty technic, has died from too early operation. As soon as the diagnosis is made the appendix should be removed. The various positions in which pus forms as the result of appendicitis are then described. The drainage of pelvic abscesses by the vagina or rectum is heartily condemned, it being called "a dangerous and temporary makeshift." In that variety of appendicular pus in which no adhesions form and diffuse peritonitis results, if the operation is not done within the first 12 hours, the patient's chances of recovery are reduced almost to nil. The author says it is better surgery to "anticipate pus than to combat it." The mortality of appendix operations done in the presence of pus ranges from 10% to 18%, while those done in the presuppurative stage present a mortality of 0.5%. It should be remembered also that operations done for suppurative appendicitis require a much longer convalescence and are much more apt to be followed by hernia and fistula.

J. H. Carstens, [2] in considering **the best time at which to operate for appendicitis,** asserts that the operation should be done when the diagnosis is made, except "(*a*) when the environments are bad; (*b*) when no experienced operator or proper facilities are at hand; and (*c*) in mild, first attacks." It is not thought that the diagnosis is a difficult one, particularly in the severer cases. One condition which may render diagnosis difficult is hysteria. Even here, however, if a little care is taken to divert the patient's mind, it will be found that the rigidity and

[1] Jour. Am. Med. Assoc., Jan. 5, 1901. [2] N. Y. Med. Jour., Aug. 4, 1900.

tenderness will disappear. We should not allow temperature to deceive us in these cases, as it not infrequently occurs in hysteria.

Kocher [1] describes his **method of early operation in perityphlitis**. The author favors operation as soon as the diagnosis has been established. Unfortunately, however, the surgeon does not usually see the case until after considerable delay on the part of the general practitioner. It is in these advanced cases that Sonnenburg has advised extraperitoneal operation. Kocher's method consists practically of two operations: first, immediate extraperitoneal drainage, and later a transperitoneal removal of the appendix. The second operation is done a few days later, when the threatened septic condition of the patient has subsided. The abscess cavity is packed with iodoform gauze and an incision made after the manner of operating between attacks. The second wound is not drained. Gauze drainage of the first wound, however, is kept up as long as necessary.

John B. Murphy, [2] in discussing the question **when to operate in appendicitis,** says that the mortality of the disease is greater than 10 % and that if an operation is done while the inflammation is confined to the wall of the appendix, this mortality may be reduced to 2 % or less. It is not thought wise to allow any case to go beyond the first 24 hours after the diagnosis is made without operation.

W. G. Richardson [3] reports 3 successful operations for **acute diffuse septic peritonitis** the result of appendicitis. The author's rule is to remove the appendix in very acute cases if, at the end of 24 hours, there is not an improvement in *all* the symptoms. Great stress is laid upon the fact that a subsidence of one or two symptoms is not sufficient to be considered improvement. Improvement has only taken place when all of the symptoms subside together.

Rotter [4] says that the most frequent location of **abscess in perityphlitis** is that which forms in the pelvic cavity. Out of 132 cases of perityphlitis the abscess was situated in Douglas's pouch in 41 cases. This form of abscess may be due to a perforation of the appendix with a gravitation of its contents to the pelvic cavity or to an infection of the serous outflow into the peritoneal cavity which collects in Douglas's pouch. A frequent symptom of abscess in this region is distention with great pain. This distention is due to pressure upon the rectum by the mass. It is often difficult to tell whether the pus found in the pelvis is of appendicular or tubal origin. If, however, it is found to contain the colon bacillus, it is of perityphlitic origin. Drainage through the vagina is recommended in these cases, excepting in young girls, when the abscess is better approached through the rectum.

F. W. McRae, [5] in considering the question of **appendicitis in the female,** quotes extensively from the literature of the subject, which shows the greatest diversity of opinion regarding the frequency of this disease in the female. He reports 20 cases in which he has operated.

[1] Correspondenzbl. f. schweiz. Aerzte, Apr. 15, 1900.
[2] Internat. Jour. of Surg., June, 1900.
[3] Lancet, Mar. 23, 1901.
[4] Deut. med. Woch., Oct. 4, 1900.
[5] N. Y. Med. Jour., Feb. 2, 1901.

In nearly all of these a mistake in diagnosis was made either by the operator or by the family physician, or by both, the disease usually being mistaken for an inflammatory condition of the tube or ovary. These cases show the great difficulty often met with in making a differential diagnosis between inflammatory affections of the pelvic organs and appendicitis. In a number of the cases treatment had for some time been directed to the genitalia, and in a few of the cases the tubes and ovaries had been removed. The author is confident that the disease is much more frequent in women than is generally supposed, and that it is frequently incorrectly diagnosed. The fact is emphasized that appendicitis in women is very apt to occur about the menstrual period. In making a diagnosis of appendicitis in women it is shown that the pain is much more sudden in its onset and more acute than that of pelvic disease. Muscular rigidity, which characterizes appendicitis, is practically absent in beginning pelvic inflammations. Nausea is frequently present in appendicitis. The general disturbance is much greater also in this disease. When in doubt it is much safer to operate.

J. H. Davenport [1] also makes a contribution to the subject of **appendicitis in women,** asserting that the disease is not as infrequent as is supposed. Acute attacks of appendicitis are not as frequent in women because of the smaller size and better blood-supply of the appendix. An incorrect diagnosis of the condition is frequently made. In every abdominal section, for whatever purpose, the appendix should be carefully examined, and it should be remembered that the appendix is frequently involved in inflammatory conditions of the pelvic organs. Davenport thinks that many cases diagnosticated as ovaritis and ovarian neuralgia occurring in women of neurotic temperament are really cases of appendicitis.

F. J. Poynton [2] discussed before the Medical Society of London the **occurrence of arthritis in association with appendicitis,** quoting extensively from the literature on the subject. It is shown that many cases are on record in which arthritis and perityphlitis reacted promptly to treatment with the salicylates. Cases have been reported also in which the colon bacillus has been found in swollen joints complicating appendicitis. Rolleston, who discussed the paper, thought that, as in the tonsil, so in the appendix, the initial inflammatory condition might possibly be of rheumatic origin. He had on one or two occasions seen slight joint pain in appendicitis.

Arthur E. Barker [3] reports 5 cases illustrating interesting and unusual **sequels of epityphlitis.** The first was that of a man who apparently recovered after the formation of an abscess in the right iliac fossa, but subsequently the patient showed symptoms of sepsis, became emaciated, had night-sweats, and developed what was supposed to be an enlargement of the liver. Later, upon examination, it was found that the patient had a large subphrenic abscess, which presented a fluctuating swelling just below the angle of the right scapula and which was pushing

[1] Providence Med. Jour., vol. I, No. 3. [2] Lancet, Oct. 27, 1900.
[3] Brit. Med. Jour., July 7, 1900.

the liver down. The abscess was incised at about the eighth intercostal space. It had worked its way up through the diaphragm and between the ribs. A large quantity of pus was evacuated and the patient recovered, but died subsequently of tuberculosis. In the second case pus extended up to the diaphragm behind the peritoneum, burst into the lung, and spontaneously evacuated itself through a bronchus. Subsequent infection of the left lung occurred, and the pus evacuated itself in the same way. This extension occurred *after* the evacuation of a large abscess in the right iliac fossa. The patient ultimately recovered. The third case was one of abscess in the iliac region and in which after operation there persisted a fistula through which was passed practically all the fecal matter. This condition did not improve and an anastomosis was made between the ileum, 2 feet above its termination, and the transverse colon, and an obliteration of the distal portion of the ileum attempted by folding it upon itself several times and then suturing it. Considerable improvement followed this operation, but still the fecal fistula persisted. A second operation was done in which both the ileum and cecum were divided near the former anastomosis, which had proved perfectly satisfactory, and their ends invaginated. The patient recovered from this operation with a mucous fistula. (See Lilienthal's case of resection of the entire colon, p. 112.) Case 4 is interesting because an intestinal concretion had escaped through a perforation in the base of the appendix and was found causing a quiet ulceration, without visible suppuration, into an adjacent coil of small intestine. The operation in this case was one of election and done at the patient's request, and at the time of operation he was in excellent condition. Barker says this is the only case which he has seen of concretion producing ulceration of the appendix and then of the small intestine without suppuration. His fifth case was one of a long appendix, the distal end of which had invaginated itself into the hepatic flexure of the colon, and which was removed with considerable difficulty.

HERNIA.

Frederick D. Bird [1] makes some valuable suggestions regarding the **technic of operations designed to radically cure oblique inguinal hernia.** It is unwise to adhere absolutely to any one method of operating, but is better surgery to change the technic to suit the individual case. The author makes an incision at least an inch above Poupart's ligament, and does not carry it as far inward as is usually the custom, stopping short, in most instances, of the external ring. On the other hand, the incision extends well beyond the internal ring. By refraining from carrying the incision into the subcutaneous fat in the neighborhood of the suprapubic region the division of certain blood-vessels and the consequent infiltration of the tissues with blood is avoided. The opening through the aponeurosis of the external oblique should be at least a half

[1] Lancet, Aug. 4, 1900.

inch above Poupart's ligament, and should be made with a blunt instrument in a line with the fibers, and should not extend as far as the external ring. The greatest stress is laid upon the preservation of the external ring and the tissues immediately overlying it, Bird claiming that in the majority of instances with an incision extending well beyond the internal ring the parts can be easily manipulated without interference with these structures. Often a hiatus is observed in the aponeurosis which can be readily enlarged with a minimum amount of damage to the part. "If we divide the ring, no suture, however deft, will make it nearly so strong as before. We divide fibers the integrity of which we can never replace." The extension of the opening outward for an inch or two produces very little damage to the wall, since the cross-fibers are fewer. "The division in the line of action of the tendinous fibers, even up to the muscular edge, in no way interferes with the mechanics of the part, but the destruction of the ring throws out of restraining action a number of fibers and renders them divulsive." The preservation of the external ring Bird has found much easier than he at first supposed it to be. He compares this method of operating to that of gaining access to the appendix by the muscle-splitting operation of McBurney. The separation of the sac from the cord should always be begun at the internal ring, where the two structures are not in such close contact as they are below. This is particularly true of congenital hernia. Bird admits that there are cases which do not permit of this simple method of attack, but urges that it should be followed whenever possible.

J. Collins Warren[1] reports 98 cases on which he has operated for the **radical cure of hernia** between the years 1888 and 1900. Of these cases, 58 have been carefully followed in order to determine the question of recurrence. A marked difference is shown in the number of recurrences following the earlier operations and those of later years. This improvement is attributed to asepsis and changes of technic. Of the cases of inguinal hernia 84% showed no recurrence 1 year or more after operation. Recurrence was more frequent in umbilical hernia than in the others. The cures following operation for inguinal hernia prior to 1895 were 69%; since 1895 the cures have increased to 92%. The author's statistics go to show that sepsis and recurrence were both more frequent when catgut was used, and hence he urges the use of silk, deeming it the best suture material which we possess. Warren's experience with this operation in old persons has been very satisfactory, differing from that of most surgeons. He agrees with Coley that if a patient continues free from recurrence for 1 year after operation he may be considered cured. The author recommends that umbilical hernia be operated upon as early as possible, since in this variety both suppuration and recurrence are much more apt to take place than in other forms. [Regarding the best suture material in the radical cure of hernia, in our own experience it has been found that the animal suture, either catgut or kangaroo-tendon, is preferable to silk, and, when properly prepared, free from all danger of infection. Coley, quoted elsewhere, inva-

[1] Boston M. and S. Jour., Sept. 13, 1900.

riably uses the animal suture and with the most satisfactory results. A very important point, insisted on by Barker, is that the sutures must not be tied very tight. A very tight suture causes necrosis, and at such a point of least resistance pus organisms are apt to lodge and multiply. We have found that the use of the subcuticular silkworm-gut suture in closing the external wound is of great value, as it tends to avoid infection from the skin staphylococcus.]

Schenk [1] reports a case of **congenital lateral ventral hernia** occurring in an infant safely delivered after breech-presentation. The hernia was about the size of a walnut, occurred on the right side between the ribs and the crest of the ilium, and increased greatly in size when the child coughed, but was easily reduced when the child was quiet. The opening through the muscular wall was about $\frac{2}{5}$ inch in diameter. There was no distinct evidence of any congenital want of development at the seat of hernia or elsewhere, and the author thinks that the weakening of the abdominal wall at this point was due to the pressure of the strongly flexed right knee. When the thigh was flexed upon the abdomen, the knee was found to fit readily in the gap of the muscles.

W. B. Coley [2] discusses the **radical cure of inguinal hernia in the female.** It is asserted that the number of inguinal hernias occurring in women exceeds that of femoral hernia occurring in both sexes, and forms 60% of all cases of rupture in women. The author's remarks are based upon a report of 134 personal cases. The removal of the sac is insisted upon, and the view of Kelly, that its removal is of little importance, is strongly opposed. The transplantation of the round ligament is never indicated. The wound is closed in three layers; the first with kangaroo-tendon, and the others with catgut. Since using rubber gloves in this operation the author has had practically perfect results in wound healing. Kangaroo-tendon and catgut have proved perfectly satisfactory and are much to be preferred to nonabsorbable suture materials. The average time that the patients were kept in bed was 10 days, and they were allowed to go home in most instances at the end of 2 weeks. A spica bandage was employed for 4 weeks after operation and then all support discontinued. All but 13 cases have been traced, and no relapse has occurred, although 16 have not yet passed the 1-year limit.

R. Hamilton Russell [3] discusses the question of **operation vs. truss in the inguinal hernia of childhood.** He contends that, excepting in very young infants, it is impossible for a truss really to cure a hernia. It may prevent its return for an indefinite period, but it never obliterates completely the hernial sac, and so long as this exists the case cannot be considered cured. Russell considers the presence of a congenital sac the sole cause of oblique inguinal hernia, and its removal the only rational treatment. He recommends operation in all cases of hernia in childhood if the operation can be done by a competent surgeon. He considers the simple removal of the sac without the

[1] Prag. med. Woch., No. 1, 1900. [2] Yale Med. Jour., Dec., 1900.
[3] Lancet, Oct. 20, 1900.

division of the aponeurosis of the external oblique or any other muscular fibers the best method of operating. He shows that the division of these muscular structures interferes with their contraction and the consequent pressure upon the inguinal canal. It is thought that frequently the sac is ligatured so high up as to include a portion of the bladder, and he recommends that the ligature should be placed at the point where the subperitoneal fat begins. He concludes in the following manner: "(1) That oblique inguinal hernia in childhood is invariably associated with a congenital sac; (2) that children may possess the sac, but may remain free from hernial descent throughout life or up to any period of life; and (3) that children possessing such a sac are predisposed to hernia throughout life. To these three propositions, which are unquestionably true, I will add the two following, which I believe to be equally true: (4) that all cases of oblique inguinal hernia occurring at any time during the course of life occur in subjects who are the possessors of a congenital sac; and (5) that subjects who have never possessed a congenital sac, or in whom the sac has been efficiently removed, can never become the subjects of oblique hernia. It would seem, then, that we may divide all men into two classes in respect of inguinal hernia—viz., the immune and the predisposed, according to the presence or absence of a congenital sac in the inguinal canal. It is essential to a clear understanding of the truss question to recognize that of the predisposed only a certain proportion become actually the subjects of hernia at any time during the course of life. On the other hand, given an individual whom we know to be predisposed by the fact of his carrying a congenital sac in the inguinal canal, it is impossible to guarantee his immunity from the occurrence of hernia from day to day. Now, the difference between the cure of hernia by operative removal of the sac and the cure by truss is the very substantial one that in the first the patient is raised to the level of the immune, while the second merely drafts him into the ranks of the predisposed."

Delbet,[1] in showing the results of the more recent operations for the **radical cure of hernia,** presents the figures of the "service des bandages," the object of which is the distribution of trusses among the poor. During 6 months of the present year 1586 patients with hernia were supplied with trusses. Only 70 of these were femoral hernias. Of the 1516 inguinal hernias, 1509 had not been operated upon, and only 7 had recurred after operation. Of the 70 femoral hernias, 2 had recurred after operation. Delbet thinks that these figures go far to indicate that the present-day operations for the radical cure of hernia are indeed radical.

Gaspare Fiore[2] suggests the use of fine gold wire in the **radical cure of inguinal hernia.** He uses it both for ligating the sac and for closure of the muscular layers. He has employed it on 7 occasions with the most satisfactory results.

Charles Adams[3] describes a case of **vesical hernia in a child.**

[1] Bull. et Mém. de la Soc. de Chir., No. 28, 1900.
[2] La Riforma Med., Aug. 28, 1900.
[3] Clin. Rev., vol. XII, No. 4.

The tumor was distinct from the testicle, was easily reducible, and presented all the symptoms of a hernia without any vesicle symptoms. When the operator incised what he supposed to be the sac, he found that he had opened a diverticulum of the bladder. No sac was present, and the herniated portion of the bladder was firmly adherent to the cord and canal. The protruding portion of the bladder entered the canal at the internal ring. The diverticulum was cut away, its walls being too thin to suture, and the opening into the bladder closed by a continuous suture. A silkworm-gut drain was employed for 4 days, but there was no leakage at any time, the wound healing at once. The portion of the bladder removed was large enough to cover the end of the forefinger to the first joint.

Lilienthal [1] presented to the Surgical Section of the New York Academy of Medicine, a baby upon whom he had **operated for strangulated hernia at the age of 8 days.** The hernia consisted of the ascending colon, the sigmoid, and appendix, together with a large portion of the small intestine. Considerable difficulty was experienced in reducing the intestine, but the patient made a rapid and satisfactory recovery. Lilienthal thinks this is the youngest child ever operated upon successfully for strangulated hernia. [The youngest child operated upon successfully in the Jefferson College Hospital was 26 days old.]

Hallet [2] discusses **congenital umbilical hernia in the new-born.** He shows that in this variety of hernia early operative interference is urgent, since the peritoneum is poorly protected and very prone to necrose. An analysis is made of 58 cases in which operation had been done for this condition. These figures show that the longer the operation is postponed, the greater is the mortality. The prognosis is greatly affected by the size of the hernia. The operation should be done as soon after the birth of the child as possible. The surgeon, however, should make a careful examination of the infant to determine whether there be any other malformations which might contraindicate operation upon the hernia.

Walker [3] reports a case of **diaphragmatic hernia** occurring in a man aged 29, who was injured by a falling tree. The patient was very weak, respirations being shallow and rapid, the pulse 145, and dyspnea marked. He complained of severe pain in the left chest, which was aggravated by coughing or deep inspiration. It was impossible to open the bowels, the abdomen became distended, and the vomiting stercoraceous in character. An examination of the left side of the chest showed diminished expansion, amphoric breathing, and a tympanitic note at the base of the lung. Succussion sounds were heard when the patient was shaken. The apex of the heart was displaced 2 inches to the right. The seventh and eighth ribs were found to be fractured on the left side. The abdomen was opened and a portion of the small

[1] Med. Rec., Mar. 2, 1901.
[2] Rev. de Gynec. et de Chir. Abdom., May–June, 1900.
[3] Internat. Jour. of Surg., Sept., 1900.

intestine found firmly held in a rent of the diaphragm. The lung was not ruptured. The bowel was withdrawn and the opening through the diaphragm partially closed. The patient made an uninterrupted recovery. In old cases of diaphragmatic hernia the transpleural route is to be preferred, since it gives a better access to the lesion.

Funck-Brentano [1] reports a case of **congenital diaphragmatic hernia** which was discovered postmortem in a child who died from convulsions when 55 days old. Examination of the body showed a free communication between the abdominal and thoracic cavities. The left pleural cavity was occupied by the spleen and large portions of both the small and large intestine. The lung on this side was no larger than a bean, and the heart was displaced to the right of the middle line. No other malformations were discovered.

Abt [2] reports a case similar in many respects to the above. The child in this instance, however, was born dead. The diaphragm on the left side was almost completely absent, the left thoracic cavity being largely occupied by the liver. The greater curvature of the stomach occupied the space normally filled by the apex of the lung. A considerable portion of both the large and small intestine occupied the thoracic cavity. The recognition of **diaphragmatic hernia** during life is extremely difficult. Out of the 245 cases collected by Leichtenstern the diagnosis was made in only 4 instances, and in each of these the patient had reached adult life. Holt has collected 116 cases due to congenital deficiency of the diaphragm. The condition is but rarely present on the right side. In the majority of instances the condition can hardly be described as a true hernia, since there is no sac. The greatest danger to infants suffering from this condition occurs during labor or during the first few days of life.

C. Hirsch,[3] in discussing the **diagnosis of diaphragmatic hernia,** reports a case which was diagnosticated pneumothorax. The physical signs present caused Hirsch to suppose the case to be one of diaphragmatic hernia, and this diagnosis was confirmed by the radiograph, which was taken after a rubber tube filled with mercury had been passed into the stomach, where, folded upon itself, it was shown to occupy the tympanitic zone in the left chest. An examination postmortem demonstrated the presence of the stomach and a portion of the duodenum in the left pleural cavity.

Harrington [4] describes a case of **hernia of the bladder through the pelvic outlet** produced by traction of a large subperitoneal fibroma. The patient was a woman aged 46. The tumor seemed to have its origin in the subperitoneal tissue in front and to the left of the bladder. In its growth it had separated the fibers of the levator ani. The growth was removed 6 years previously, but had returned. The weight of the tumor had produced sufficient traction upon the bladder to cause it to pass through the opening in the levator ani and occasion complete reten-

[1] Bull. et Mém. de la Soc. Anat. de Paris, No. 6, p. 637, June, 1900.
[2] Chicago Recorder, Aug., 1900. [3] Münch. med. Woch., July 17, 1900.
[4] Ann. of Surg., Sept., 1900.

tion of urine. The abdomen was opened with the idea of removing the tumor and restoring the bladder to its normal position. This, however, was found to be impossible, so that it was determined to attack the growth from below. The tumor and bladder were approached through an incision extending from the tuberosity of the ischium to the upper part of the labium. It was difficult to distinguish the bladder from the tumor. When the former, however, had been distended with air, its separation from the growth was more readily accomplished. The bladder was restored to the pelvis and the growth removed. The bladder showed a marked tendency to become herniated again through the opening in the muscle. After considerable deliberation it was determined to employ the uterus to occlude the opening. This step seemed justifiable when the age of the patient was considered and the fact that she had suffered from repeated attacks of uterine hemorrhage. Before fastening the uterus in its new position the appendages were removed. The patient made a satisfactory recovery and has suffered from no bladder symptoms since her operation.

Dentu [1] details the steps of an operation which he has employed for the last 12 years for the **radical cure of inguinal hernia**. The incision is the same as that of the Bassini operation. The aponeurosis of the external oblique is carefully exposed, but not divided. The sac is then separated from the cord and its other attachments as far up as the internal ring. A small opening is then made in the aponeurosis at one side of the internal ring, and through this is passed a long forceps which grasps the fundus of the sac and draws it through the opening. The neck of the sac is then ligated and returned to the abdomen or inclosed within the mattress sutures which close the opening in the aponeurosis. The redundant anterior wall of the canal is folded upon itself parallel to its long axis and secured in this position by mattress sutures. The advantage of this method of procedure is that the aponeurosis of the external oblique is nowhere divided over the canal. Dentu's results have been as satisfactory as when he has employed the Bassini operation. [This seems to be an operation similar in principle to Kocher's.]

A. M. Phelps [2] asserts that he has employed his method of **radically curing hernia** in 216 cases with perfect results. The author believes that relapses after hernia operations are due entirely to the stretching of the scar, and therefore he devised the operation which consists in the use of a continuous suture of fine silver wire. Stress is laid upon the fact that the peritoneum and transversalis fascia should not be ligated, but that they should be sutured with a continuous fine silver wire. The muscles are then brought together over the peritoneum by another continuous silver suture. If the structures are much attenuated, a thin mattress of wire is placed between the muscular layers. The cord is brought out through the aponeurosis of the external oblique and allowed to rest upon this tissue as in the Halsted operation. The opening through the aponeurosis is notched in order to prevent compression of

[1] Rev. de Chir., Dec. 10, 1900. [2] Med. Rec., Sept. 22, 1900.

the cord. Phelps employs a small glass drain. If infection takes place after the operation, the external wound only is opened and the cavity thoroughly cleansed with pure carbolic acid, which is closely followed by alcohol. Phelps says that it is a mistake to remove the suture in case of infection. It is claimed that infection does not influence the result if the suture is not removed and the wound treated as recommended. In his own 216 cases infection has occurred 16 times.

Moynihan,[1] after dealing with the **anatomy of inguinal hernia,** discusses the **operations** of Bassini, Halsted, and Kocher, expressing preference for the first. In order to avoid recurrence at the internal ring after operation, it is Moynihan's custom to separate the cord into several parts, bringing these out through different openings into the aponeurosis of the external oblique. By pursuing this plan there is much less likelihood of a recurrence than when the whole cord is brought out at one place. When it is difficult to produce a strong support at the site of the external ring he has found it of great advantage to open the rectus sheath and suture some of the fibers of this muscle to Poupart's ligament, a plan introduced by Wolfler in 1892 and recently strongly advocated by Bloodgood. [Not only advocated by Bloodgood; he greatly improved the method.] Moynihan had employed this device for a number of years before knowing of its advocacy by either Wolfler or Bloodgood. In referring to the radical cure of femoral hernia, he says that his results have been decidedly more satisfactory than in inguinal hernia. The operation of Lockwood is considered the most rational for this condition. In dealing with the subject of strangulation the author takes occasion to condemn most heartily the employment of taxis in this condition, showing that in many instances the hernia may be reduced and yet strangulation not relieved. During the last 14 years at the Leeds Infirmary the mortality of strangulated inguinal hernia submitted to operation has been 17.4%; for femoral hernia, 23.8%. This apparently high mortality is due to delay and not to operation. During the past 5 years the mortality of radical cure operations in both femoral and inguinal hernia has been below 1%. Reference is made to the utterly futile and misleading comparisons made by some statisticians of the mortality-rate of those cases of strangulated hernia in which an immediate resection of the bowel is done and those in which an artificial anus is made. Resections are done only in the less severe cases and by competent surgeons, while the formation of an artificial anus is resorted to many times when the patient is moribund and by those who are unskilled in surgical technic.

Anderson,[2] in presenting some remarks on the **radical cure of hernia,** based on an experience of 190 cases of operation for the cure of inguinal hernia, states the mortality of the operation to be about 1% in nonstrangulated cases. Out of his own 190 cases there were 4 deaths; 2 of these, however, occurred in cases of strangulated hernia. A combination of the Halsted and Bassini operations is advocated. It is thought that with our present knowledge of results following these

[1] Practitioner, Nov., 1900. [2] Brit. Med. Jour., Feb. 2, 1901.

operations we can confidently promise to our patients a radical cure. Unless the cord is large, resection of the veins should not be employed, and under no circumstances are the veins interfered with in children. Anderson uses silk as his suture material and has had no cause to regret it. In 60 operations performed during the past year in which silk was used no infection took place in a single case. Anderson has never seen late infection follow the use of silk sutures. In children the operation should be recommended if the ring is large and the hernia not perfectly controlled by the truss.

Joseph A. Blake [1] shows that much confusion has arisen from the fact that within recent years two very different portions of tissue have been described as the **conjoined tendon** by different writers. In America the term conjoined tendon is usually understood to indicate the combined fibers of insertion of the internal oblique and of the transversalis muscles into the pubic bone. Many authors, particularly Bloodgood and Halsted, refer to the transversalis fascia or aponeurosis as the conjoined tendon. If these two uses of the expression are not borne in mind it is difficult for the reader to comprehend some of the recent literature on the subject of hernia and its radical cure.

J. C. Stinson [2] details the **treatment of umbilical hernia** in children and adults and describes a **new method of radical cure.** True congenital hernia of the umbilical cord is very rare, occurring once in about 5000 children. Spontaneous cure does take place in this condition, but is most unusual. The cure takes place by pressure resulting from cicatrization. The great danger in these cases is peritonitis, the result of traumatism or infection. The prognosis is very grave. Stinson has collected 26 cases in which the expectant plan of treatment was applied, consisting of antiseptic dressings, compresses, etc., and 23 of these proved fatal. Of 55 cases in which operation was done there were but 8 deaths. It is recommended that operation should be performed as early as possible. After the sac is opened the umbilical vessels should be tied separately and all gelatinous tissue and granulation removed and the wound closed in layers. The earlier the operation, the more favorable will be the result. The ordinary button or cork compress should be used in children under 6 months of age. In fat children a fold of skin and subcutaneous tissue may be pinched up on either side of the hernia and brought together by means of an adhesive strip. These folds act as a pad and retain the hernia. Although the hernia may disappear within a few months after this form of treatment, the latter should be kept up for a year. If the child is a year old or over, a spring truss should be applied. Umbilical hernia in adults usually emerges from the upper portion of the ring. Adhesions are very common, rendering the hernia partly irreducible. Intestine alone is rarely found in umbilical hernias. Spontaneous cure is never seen in adults, and mechanical treatment is seldom successful. Relapses after radical cure operations for this variety of hernia are much more common than in cases of inguinal or femoral hernia. The irritation produced by a

[1] N. Y. Med Rec., Sept. 1, 1900. [2] N. Y. Med. Jour., Sept. 29, 1900.

truss or support is very apt to excite inflammation of the skin over the hernia, producing ulceration and sometimes local peritonitis. Strangulation of umbilical hernia in adults is rarer than of inguinal or femoral hernia, but is much more dangerous. In cases of strangulation operation should be performed early. Operation should also be resorted to in irreducible hernia if the truss pressure produces pain or gives rise to obstruction. The larger the hernia, the less favorable is the prognosis for a radical cure operation, since in these cases the fascial and muscular layers are atrophied. Stinson considers the closing of the breech in the abdominal wall without tension the most important part of the radical cure operation. He makes an oval incision, opening the sac laterally where no adhesions exist. After the sac is opened all adhesions are separated and the enlarged omentum removed. It is advised that in removing the omentum only its vessels should be ligated. The sac is carefully excised until the edges of the parietal peritoneum are reached. The peritoneum and transversalis fascia are united with a continuous stitch of chromicized tendon. When the opening is not large the linea alba and the sheaths of the recti muscles are united in two layers with the same suture material. If tension is required to approximate the layers, then the rectus sheath is split, the muscle freely separated from it and brought inward to unite with its fellow in the median line. The two muscles are sutured with heavy chromicized tendon and the outer border of each muscle united to the inner border of its sheath. Occasionally it is only necessary to bring one muscle out of its sheath in order to close the opening. The superficial layers of fascia should now be approximated if this can be accomplished without tension; otherwise they should be sutured as far inward as possible to the recti muscles. No suture should be introduced in the fatty layer. The skin is closed with a continuous subcuticular suture. Stress is laid upon the advantage of ligating the omental vessels separately. Stinson uses the continuous reef-knot stitch. He thinks that the cut ends of interrupted sutures are apt to become untied or to produce irritation. Mattress sutures are not used because they do not produce accurate coaptation of edges. No suture should be drawn tightly, since it will produce anemia and subsequent sloughing. Any constriction of fat will produce fat necrosis resulting in the discharge of fluid from the wound. After the skin suture is removed collodion should be applied to prevent stretching of the scar. The failure of the operation is believed to be frequently due to the use of nonabsorbable sutures or those which absorb too rapidly. Stinson does not believe in the ligation of the neck of any hernial sac, but advises that the mouth of the sac be closed by a continuous suture. The suturing of the sac in the ring or using it in the form of a pad to prevent return of the hernia is also condemned. Great care should be taken to see that the edges of the different layers do not overlap, as this greatly interferes with union and increases intraabdominal pressure. Since increased intraabdominal pressure is the greatest factor in producing recurrence, care should be taken to overcome this as far as possible. Stinson does not approve of

the use of relaxation sutures or of any suture which passes entirely through all the layers of the abdominal wall.

E. D. Ferguson [1] describes a method of operation in **umbilical hernia** which he has found successful. After the usual treatment of the sac and its contents the recti muscles are thoroughly exposed, their sheaths divided along the outer border of the muscles, dissected free from the muscle, then turned to the median line and sutured with chromicized gut or tendon. It is claimed for this operation that a firm, fibrous obstruction opposes the return of the hernia, that the intraabdominal pressure is not increased, and that there is the least possible tension in the wound.

Francis T. Stewart [2] reports a case of **enormous ventral hernia** occurring in a woman 40 years of age. The hernial contents consisted of the lower half of the stomach, all of the transverse colon, the omentum, and most of the small intestine. Great difficulty was experienced in returning the contents to the abdominal cavity, but this was finally accomplished and the patient made a good recovery. Two months after the operation there was no evidence of return.

Manley [3] contributes an extensive article on the subject of **strangulated and gangrenous hernia.** The mortality from strangulation and its causes is dealt with first. The causes of strangulation are said to be: "(1) Enteroptosis, compression of the gut with alimentary impediment, or asphyxia; (2) torsion of the gut; (3) stricture or partial stenosis." It is shown that there is a violent attempt made by nature to withdraw from the hernial sac any portion of intestine which becomes constricted. This at times may be so forceful as to produce serious damage to the intestine. The condition of the mesentery of a strangulated intestine is of the greatest importance, since any interference with its function means the death of the bowel. Berger, of Paris, in an examination of 10,000 hernia cases in both sexes, found strangulation to occur 3 times more frequently in the female than in the male. Gibson collected 332 cases of gangrenous hernia operated upon between 1888 and 1898; of these, 123 were males and presented a mortality of 28%; 209 were females, with a mortality of 39%. It has been clearly shown that the mortality is in direct proportion to the delay in operating. The author recalls the tendency of certain practitioners to prolong palliative treatment and taxis until the patient is practically moribund, and then to call in a surgeon or send the patient to a hospital. The protracted and rough methods of taxis largely augment the mortality of operation. A number of eminent surgeons discount entirely the employment of taxis. When there is no evidence of organic disease, and circumstances are such as to render an aseptic operation possible, taxis should not be employed in any stage of strangulation, but a radical operation immediately instituted. Many cases come to the operating table showing gross lesions of the sac contents from the prolonged and improper use of taxis. Every operation for strangulated hernia should, if possible, be a radical one.

[1] Phila. Med. Jour., Oct. 20, 1900. [2] Phila. Med. Jour., Feb. 9, 1901.
[3] Phila. Med. Jour., Mar. 16, 1901.

Before the surgeon begins the operation he should always have appliances at hand and ready for intestinal resection. In discussing the pathology of strangulated hernia Manley says the mucosum which requires the greatest vascular supply is the first to lose its vitality from strangulation, and, being in immediate contact with the bowel contents, rapidly becomes inflamed and ulcerated. It is this injury of the mucous coat which produces hemorrhage into the bowel and often uncontrollable diarrhea. Occasionally the mesentery is more damaged by strangulation than the intestine itself, and if a careful examination of this structure is not made, postoperative complications are very apt to arise. The curious clinical fact is noted that an inflammation of the mucous coat of the intestine produces an increased peristalsis, whereas an inflammation of the serous coat diminishes or suppresses peristalsis. Several cases are mentioned which illustrate the damage which the intestine may do itself by attempts to withdraw a strangulated portion. In one case 30 inches of small intestine was spontaneously detached on one side and nearly so on the other. Manley shows that the simple reduction or supposed reduction of a strangulated hernia does not always relieve the symptoms, but that not infrequently the symptoms continue and the patient dies. This is the result of forcing into the abdomen twisted, kinked, adherent, asphyxiated, or gangrenous coils of intestine. These internal strangulations could be avoided in nearly all instances by a carefully performed herniotomy in which the sac is opened and its contents given the proper attention. In referring to the symptomatology and diagnosis of strangulated hernia Manley urges upon the surgeon the necessity of a most careful and thorough examination of the possible seats of hernia in all cases in which the symptoms could possibly be ascribed to this condition. He says one of the most prolific causes of dangerous changes in strangulated hernia is a tardy recognition of the condition. Often the real cause of the trouble is not discovered until the patient himself calls the attention of the physician to the fact that he has a "sore lump" at the navel or in the groin. Serious strangulation may exist without certain of the cardinal symptoms of the condition being present. In the palliative treatment of strangulation Manley thinks that the simpler the treatment, the more successful it will be. He recommends absolute rest in bed, with the administration of an opiate, to be followed by mild taxis. In cases of strangulated hernia accompanied by profound collapse, when the surgeon dare not undertake a formidable operation, a division of the structures over the neck of the sac should be made under local anesthesia. Usually, when the constriction is relieved, the patient's condition greatly improves, and not infrequently a general anesthetic can then be administered and the operation completed. Preliminary irrigation of the stomach prevents the possibility of the inspiration of vomited fluids of a septic character. This accident, however, is rare. Manley condemns the use of "hernia bistouries." Not only should the contents of the sac be carefully examined, but the intestine above the ring should be drawn down and thoroughly inspected. Rough transport of the body after strangulation is established and full pulmonary

anesthesia are active causes in the increase of shock. Cases of strangulated hernia should therefore be sent to the hospital early. The condition of incipient gangrene is next discussed. The difficulty of deciding upon the best treatment of the bowel in this condition is referred to and Jordan Lloyd quoted as saying: "The recognition of gangrene in a coil of intestine lying before us in an open sac is not always an easy matter. Few surgical complications are more perplexing than that of determining whether a coil of gut shall be returned to the abdomen or be treated where it lies. No judgment can be formed merely by the color of the coils, nor can any analogy be drawn from one's experience of gangrene of the outer surface of the body." Manley thinks that when there is a question of doubt regarding the vitality of the bowel it should not be restored to the abdomen, but that a resection should be done. The resection, of course, should only be done if the patient's condition warrants the operation; otherwise an artificial anus should be established. The attitudes taken by various surgeons regarding the question of immediate resection in gangrenous hernia are given. The establishment of an artificial anus is only justified when the patient is bordering on the moribund state or is in the hands of an incompetent surgeon. Extensive comparison is made between the mortality of immediate resection and the establishment of an artificial anus. Temporary evisceration with lateral anastomosis *in situ* is not recommended. The procedure of Helferich, of anastomosing the healthy intestine above the gangrenous portion and allowing the latter to remain in the wound until the patient has reacted, when resection is done, is one of which Manley does not approve. Gibson has shown that the mortality of secondary resection after the establishment of an artificial anus is as high as that of primary resection. In performing an anastomosis after resection of a gangrenous bowel the author prefers the lateral method to the end-to-end.

[The following surgeons have reported successful cases of **primary resection in cases of gangrenous hernia**: W. C. Wood ("Brooklyn Medical Journal," October, 1900) and Stirling ("Intercolonial Journal of Australasia," March 20, 1901).]

Hofmeister [1] makes a strong plea in favor of **primary resection of gangrenous hernia.** He has had 25 primary resections with a mortality of 40%. Von Bramman's statistics show that the mortality following the establishment of an artificial anus in 68 cases was 46.6%. [Comparison of these mortality-rates is hardly fair, since all surgeons resort to the formation of an artificial anus in cases so far advanced as not to warrant a resection.] In all of Hofmeister's cases operation was begun under Schleich's infiltration-anesthesia. Division of the constricting band and dissection of the sac were painful at times. It was necessary to resort to ether in a few cases. Care should always be taken to perform the resection through perfectly healthy bowel, and particularly at the proximal portion. The author practises lateral anastomosis. A beginning peritonitis with serosanguineous exudation is no con-

[1] Beitr. z. klin. Chir., Bd. XXVIII, H. 3.

traindication to resection. The infiltration-anesthesia is deemed of the utmost advantage in these cases. There was a marked absence of bronchopneumonia, and this was attributed to the fact that ether was not used. Death was due in most instances to faulty technic or to the fact that insufficient bowel was removed.

Carl Beck [1] describes a method of **repairing the abdominal wall in ventral hernia** which he has found useful. In a case of large ventral hernia following appendicitis Beck found it impossible to approximate the edges of the opening in the abdominal wall and devised the plan of dissecting off the upper layer of the rectus to a sufficient extent to cover the hernial opening. This is well illustrated in the accompanying cuts (Figs. 32 and 33). Two months after the operation there was not the slightest evidence of hernia.

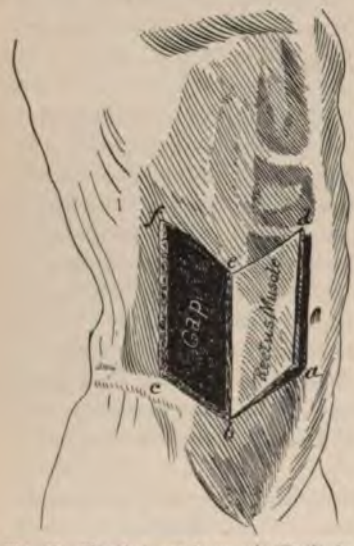


Fig. 32.—Showing gap in muscle (Beck, in Med. News, Oct. 27, 1900).

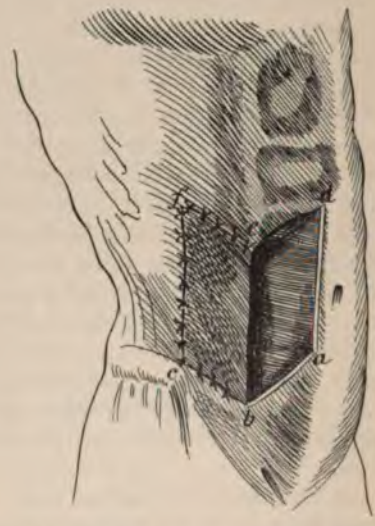


Fig. 33.—Showing gap closed with flap (Beck, in Med. News, Oct. 27, 1900).

A. R. Moulton [2] reports a case of **rupture of the rectum with hernia of the intestines** in an insane man. The patient developed the habit of dilating the sphincter and producing rectal prolapse, and required constant watching. The patient was found in a collapsed condition after a visit to the bathroom. An examination showed that the patient had ruptured his rectum and that there protruded from the anus 2 feet of small intestine with its mesentery. The patient died of shock 36 hours later.

Paul F. Morf [3] reports a case of **hernia of the Fallopian tube without hernia of the ovary.** The patient, a young woman aged 24, had suffered from a congenital hernia in the left inguinal region. Upon examination the mass could not be reduced nor could any impulse be

[1] Med. News, Oct. 27, 1900. [2] Phila. Med. Jour., Mar. 16, 1901.
[3] Ann. of Surg., Mar., 1901.

detected on coughing. The patient suffered also from a profuse vaginal discharge. From the sac, when opened at the operation, flowed a small amount of thick, greenish, mucopurulent fluid. The contents of the sac proved to be a portion of the omentum together with the Fallopian tube. As the tube, omentum, and ovary were involved in the inflammatory process, they were removed. The wall of the tube was not sufficiently thickened to constitute a chronic salpingitis. The fimbriated extremity of the tube, however, lay in a collection of mucopus. This case is considered interesting as it illustrates the extension of an inflammation from the vagina through the uterus and then through the Fallopian tube into the sac of a hernia, where it caused suppuration. The author submits a study of 24 cases collected after a careful search of the history of hernia of the Fallopian tube without hernia of the ovary. In not one of the 24 cases was a correct diagnosis made before operation, nor was the presence of the tube suspected in any of them. The author attributes the rarity of this variety of hernia to the fact that, unless drawn in by a previous hernia of the ovary, it is difficult for the tube to find its way into the hernial opening, as it is usually so deeply placed in the pelvis. Of the 24 cases, 13 were inguinal, 10 were crural, and 1 was obturator. Of the 13 inguinal hernias, 5 occurred in infants. At this age the fact that the canal of Nuck is still patent and that the tube occupies a higher position in the pelvis explains the frequent occurrence of this variety of hernia in infancy. Fibroid growths, as well as pregnancy, which raises the position of the tube, might be considered predisposing causes. Morf, in discussing the morbid anatomy of this condition, says that strangulation was present in 14 of the 24 cases. Of these, 6 were inguinal, 7 femoral, and 1 obturator. Maydl's case, in which the tube passed into the sac and out again, is of peculiar interest because the strangulated portion was within the abdominal cavity. Abscess formation in one case in which strangulation was not relieved resulted in spontaneous rupture and recovery. In a number of cases inflammatory conditions with pus formation were present, independent of strangulation. There were evidences of chronic inflammation in several cases, and cystic dilation of the tube was observed in 3 instances. In Jordan's case pregnancy had occurred in the herniated tube and advanced to the eleventh or twelfth week, when symptoms of strangulation developed, requiring operation. A fetus 7.5 centimeters long was removed from the sac. In only 3 instances, all of which occurred in infancy, was the tube found normal. Morf thinks that it is practically impossible to make a diagnosis of the presence of the Fallopian tube alone in the sac, but when accompanied by hernia of the ovary he considers the condition possible of diagnosis.

A. J. Ochsner,[1] after considering the **treatment of hernia in children,** reaches the following conclusions: "(1) The development of hernias in children is favored by (*a*) faulty development of the abdominal wall; (*b*) insufficient strength in the tissues involved in closing the umbilical, inguinal, or femoral openings; (*c*) abnormal intraabdominal pressure;

[1] Jour. Am. Med. Assoc., Dec. 22, 1900.

(*d*) unclosed condition of the tunica vaginalis. (2) The causes *a* and *b* are likely to be inherited. (3) The abnormal intraabdominal pressure is due (*a*) to gaseous distention resulting from improper feeding; (*b*) to the exertion necessary to accomplish defecation in case of chronic constipation; (*c*) to the same exertion necessary to evacuate the bladder on account of obstruction due to phimosis; (*d*) to severe long-continued coughs. (4) A large majority of all cases of hernia in children will heal spontaneously if the increased intraabdominal pressure is relieved, the hernial sac being kept empty. (5) This can be accomplished by means of trusses, or much more rapidly, in inguinal and femoral hernia, by placing the child in bed with the foot of the bed elevated, the time required usually not exceeding 6 weeks. (6) Children with a tendency to the formation of hernia should be guarded against developing coughs. (7) Their diet should be given at regular times and chosen with a view to avoiding gaseous distention. (8) Constipation should be prevented entirely. (9) In case of boys, phimosis should be relieved if present. (10) Badly nourished and badly cared for children of the poor should be treated in hospitals, being placed in bed in the inverted position, the cause of increased intraabdominal pressure being removed at the same time by proper treatment. (11) Operation is indicated (*a*) in strangulated hernia; (*b*) in irreducible hernia due to adhesions; (*c*) in case the opening is unusually large in a free hernia, especially if the condition is hereditary and the hernia cannot be retained by means of a truss; (*d*) in reducible hydrocele. (12) Except in class *c*, the operation should consist simply in carefully dissecting out the sac, ligating it within the abdominal cavity, cutting away the sac and permitting the stump to retract within the abdominal cavity, and simply closing the wound in the skin. (13) The recumbent position, with the foot of the bed elevated, is of very great importance in the operative as well as in the nonoperative treatment of hernias in children. (14) If the child cannot be kept in this position sufficiently long, a well-fitting truss should be worn night and day until there has been no protrusion for at least 6 months, at the same time the necessary precautions being constantly taken to guard against intraabdominal pressure from any cause."

DISEASES OF THE LIVER, GALL-BLADDER, PANCREAS, AND SPLEEN.

W. C. Wood[1] discusses the question of **abscess of the liver.** Traumatism as a cause of abscess of the liver is not uncommon, both penetrating and nonpenetrating injuries resulting occasionally in this condition. Parasites are occasionally to be regarded as a predisposing cause of liver suppuration, acting as a foreign body. Roundworms and hydatids are the most frequent forms of parasites found in liver-abscess. The cases caused by roundworms occur usually in children. The worm finds its way up the bile-ducts from the intestine, is killed by the bile, and pus is formed by organisms carried in by the worm. Wood has seen

[1] Brooklyn Med. Jour., Dec., 1900.

marked obstructive jaundice occur 3 times in a child 4 years old, and on each occasion it was suddenly relieved by the passage of a roundworm. Liver-abscess may result from extension from adjacent organs, particularly the lung, pleural cavity, gall-bladder, and bile-ducts. Pyemia is the most frequent cause of the condition, and the abscesses occurring in the course of this disease are usually multiple and consequently most serious. A pyemic abscess may result from infection carried through the portal vein from some ulcerative process in the intestinal tract. A pyemic abscess may have its origin in a suppurative process in a distant part of the body, and here the infection takes place through the hepatic artery. Infection is said to occur occasionally through the inferior vena cava. The walls of a recent abscess of the liver are soft and friable and show no limiting membrane. The more chronic cases, however, present a fibrous wall which will permit of curetment. If unopened, about 30% of these abscesses will rupture into some adjacent cavity or organ. In about one-half of the cases no pus-producing organisms are found. In the pyemic cases the staphylococcus is more likely to be found than the streptococcus or the colon bacillus. Cases resulting from dysentery frequently show Amœbæ coli. The symptoms of tropical abscesses are latent in about 13% of cases, the condition being unrecognized until rupture takes place into some adjacent organ or cavity. The majority of cases, however, present distinctive local symptoms, such as rigidity, tenderness, pain, and localized enlargement of the liver. Jaundice is usually absent, but the patient's complexion is of a muddy hue. Reflex pain in the scapular region, or reflex cough or hiccough with gastric disturbance, is frequently observed, varying with the position of the abscess. The history of the patient and a careful examination of other organs are of diagnostic value, since the condition is usually a secondary lesion. The use of the exploring needle or the aspirator is indicated as a diagnostic means, but the surgeon must be prepared to incise promptly in case pus is found. Careful aspiration of a liver is harmless, but the operator should see that no leakage occurs into the peritoneal or pleural cavity. The syringe should be looked upon as a diagnostic and not a therapeutic agent. All cases of single abscess should be operated upon. If, however, the liver is known to contain multiple abscesses, as is the case in pyemia, no operation should be done. A general enlargement of both lobes indicates multiple abscesses, whereas a local definite swelling would most likely prove to be a single pus collection. One should not be misled, in making a diagnosis, by the duration of the symptoms, since in many cases the course of the disease extends over months. A careful consideration of the patient's history would in most instances enable the surgeon to make a differential diagnosis from other conditions. "The prognosis is most grave. Statistics seem to indicate that 93% of all cases untreated are fatal. About 10% rupture into the lung, which is the most favorable termination for a natural cure, as half of these recover, or 5% of the whole number. A very small number open safely through the skin, and probably a few become encapsulated. It would seem as if about 7% would recover without interference. Rupture into

the colon has been followed by a cure. All peritoneal ruptures have been fatal except one case saved by prompt operation. Combined statistics of tropical countries show that there half the cases are single and half multiple. Here, probably about 70% are multiple and 30% single." Surgical treatment should be instituted as soon as the diagnosis is made. The plan of waiting for adhesions to form or for the pus to approach the surface is a mistake. Delay is dangerous, because it means a greater involvement of the liver, more septic absorption, the probability of the formation of other abscesses, and the possibility of rupture. Zancarol, of Alexandria, reports 50% of cures out of 154 cases, and in 40% of these 154 cases the abscesses were multiple. Of the cases of single abscesses, he cured 90%. The abscess should be opened through the peritoneal or pleural cavity, depending upon its situation. The greatest care should be taken to protect these cavities from infection during drainage. This can best be done by packing.

Robinson [1] reports 5 cases of **tropical abscess of the liver** occurring in United States soldiers in the Philippines. In 96 autopsies done upon patients who died of dysentery, liver-abscess was found 12 times. Attention is called to the rarity of this disease among the Spaniards and Filipinos. It is thought that overeating and overdrinking, together with lack of exercise and exposure, are predisposing causes to this condition in Europeans and Americans. The ameba was found in about half the cases. The right lobe of the liver was the one usually affected. Of the 5 cases operated upon, 3 presented multiple abscesses in which nearly the whole liver substance was destroyed. But 1 of the 5 cases resulted in recovery. Rupture into the pleura is the most common form of spontaneous evacuation of these abscesses. In each case an exploring needle was used to locate the pus. It is shown that it is not sufficient to make exploratory punctures in the eighth interspace alone. No complication resulted from the use of aspiration in 21 cases. When pus is found, operation becomes imperative. The advice to stitch the capsule of the liver to the margin of the wound was not found practicable, the tissue being so friable that no stitches would hold. Robinson recommends that gauze packing be employed when infection of the peritoneum or pleura is present.

Giordano,[2] of Venice, in discussing before the Section on Surgery at the Intercolonial Congress of Medicine, 1900, the **pathology and treatment of liver-abscess,** said that since 1884 he has operated upon 72 cases of abscess of the liver. Most of the patients were addicted to the use of alcohol, and he believed that cirrhosis caused by alcohol predisposed to liver-abscess. Before opening the abscess the peritoneum should be well protected by gauze packing. The cavity should not be washed out. Of his 72 cases, 42 terminated in recovery. Giordano thinks that death in the 30 fatal cases was to be attributed largely to delayed operation. Adamidi, of Cairo, agreed with Giordano that alcoholism is a predisposing cause of liver-abscess, but stated that the determining cause is an ascending angiocholitis of intestinal origin. Although a

[1] Jour. Am. Med. Assoc., May 11, 1900. [2] Brit. Med. Jour., Oct. 13, 1900.

number of cures have been reported from rupture into the lung, it should also be remembered that many cases terminate fatally in this way. Adamidi says that the treatment should consist only in early and thorough drainage, and recommends that this be done by the two-stage method, which is productive of better results than when the operation is completed at once. Hacbe, of Beyrout, condemned the method of rapidly opening these abscesses after the plan of Little.

Darnall [1] reports 4 cases of **amebic abscess of the liver** which he operated upon on the hospital ship "Relief." The patients were all of the United States army. The ameba was found in each case in the contents of the abscess or in the scrapings removed from its walls. In 2 of the cases amebic dysentery was present at the time of operation. In the others no history of diarrhea or dysentery, recent or remote, was obtained, although the patients had been in the tropics for more than a year. An irregular fever was present in all of the cases; there were no chills; sweating occurred in 2 of the cases, and usually took place after midnight. Pain in the right shoulder was present in all of the cases. Leukocytosis was present to a slight degree in all cases. The patients possessed excellent appetites, a point which Darnell thinks of some diagnostic value. In 2 of the cases the appetite was good until near the fatal termination. The urine was normal in both quality and quantity. In 2 of the fatal cases there was a pericardial effusion. It was found impossible to make a positive diagnosis without the use of the exploring needle. The abscesses were multiple in 2 instances. The disease was situated in the right lobe in all of the patients. The treatment is operative and should be instituted as soon as a diagnosis is made.

Smits,[2] during 8 years, has in the island of Batavia operated 21 times for **liver-abscess** with 18 recoveries. Smits places much value upon exploratory puncture as a diagnostic measure which enables the surgeon to make an early and positive diagnosis. When pus is found a radical operation should be immediately practised. The needle should not be used when the abscess is supposed to be seated near the anterior margin of the liver or in the left lobe. In such cases an exploratory laparotomy should be made. The older method of puncture and drainage is both ineffectual and dangerous. It is Smits' custom to make a free exposure of the affected portion of the liver by an abdominal or transpleural opening, and, when firm adhesions have been established, to open the abscess by means of the actual cautery. This practice proved successful in 16 out of 19 cases.

Major Dick,[3] of the British army, reports 3 **successful operations for liver-abscess.** In each case the abscess was drained after the resection of a rib. The patients were all soldiers of the British army in South Africa.

Packard and Le Conte [4] contribute a very complete article on the subject of the **surgical treatment of ascites due to cirrhosis of the liver** and report 2 cases. One of the patients showed some tempo-

[1] N. Y. Med. Jour., Feb. 9, 1901.
[2] Arch. f. klin. Chir., Bd. LXI, H. 1.
[3] Brit. Med. Jour., Mar. 9, 1901.
[4] Am. Jour. Med. Sci., Mar., 1901.

rary improvement, but died 61 days later. After the operation there was an enormous increase in the size of the veins of the abdominal wall. This patient died, as do many others with advanced cirrhosis of the liver, from progressive toxemia and a gradual functional failure of all the organs. The second patient died 4 days after operation and no autopsy was permitted. The history and literature of the operation are carefully reviewed by the writers. Le Conte recommends that local anesthesia or chloroform narcosis should be employed instead of ether narcosis, and describes the operation as follows: "The incision is made above the umbilicus and a little to the left of the median line, so that no injury may come to the vein in the round ligament. The liver is then inspected and palpated to confirm the diagnosis. A small opening in the median line above the pubis is made, and through this the fluid is siphoned off while the operation above is being completed. The parietal peritoneum over the omentum, liver, and spleen (if the latter organ is enlarged) is dried and gently rubbed with a gauze sponge, the same treatment being also given to the surfaces of the organs. Rougher handling is entirely unnecessary, as a healthy peritoneum when brought in contact with dry gauze for a fraction of a minute will retain the impression of the gauze mesh. The omentum is then stitched in two or three places with catgut to the anterior abdominal wall and the incision closed. If the operation is undertaken in a hospital, where you may be reasonably sure that a drainage-tube will be properly cared for, drainage may be made through the lower opening, particularly in cases in which the ascites has been rapidly reaccumulating. If you have no confidence in the nursing, close the lower wound also and resort to tapping until such time as the collateral circulation has been established. Drainage is very useful for 3 or 4 days, until the adhesions can become firm. To use it for more than a week seems to be a useless risk to the patient, as a tube tract is probably not formed so quickly as in an ordinary laparotomy, owing to the abundant secretion of fluid, and therefore the dangers of infection are greater. If the Trendelenburg table is used, the patient may be raised to a semi-sitting position while the ascitic fluid is being siphoned off. After the dressing is applied the abdomen should be encircled with broad adhesive straps from the ensiform cartilage to below the umbilicus, in order that the parietal peritoneum may be brought and kept in contact with the visceral. The operation can be quickly finished, and should be scarcely more dangerous than an exploratory laparotomy; but we must remember that other organs besides the liver are frequently diseased (the heart, kidneys, and blood-vessels), and such subjects endure operative interference but poorly." Packard and Le Conte have collected reports of 22 cases, and from a study of these and from their own experience reach the following conclusions: "*A priori* cases of cirrhosis of the liver stand injury badly, and therefore are poor subjects for operation. The resistance of their tissues is presumably much less than in health. The exact estimation of the amount of degeneration of the various organs, including the liver, is extremely

difficult or impossible, consequently the mortality of the operation under consideration would naturally be expected to be relatively high. The statistics given above seem to show that the operation has won a distinct place, and in the future a clearer conception of the suitability of particular cases for the operation may be possible. Without operation these patients as a class are doomed to a life of perpetual invalidism, requiring constant treatment and repeated tappings to make life bearable. It is our opinion that when the diagnosis of pure portal cirrhosis of the liver can be made, and when persistent and well-directed medicinal treatment is productive of insignificant results, the operation should be strongly recommended. On the other hand, it would seem that the operation is scarcely indicated, if not contraindicated, in cases of ascites associated with other kinds of cirrhosis (Hanot's, syphilitic, mixed, etc.), or with chronic peritonitis."

Frazier [1] reports a case of **cirrhosis of the liver successfully treated** by the establishment of adhesions between the omentum and the parietal peritoneum. In this paper Frazier deals with the history of the operation and refers to the 13 cases which had been operated upon at the time of his report.

Another discussion of the **operative treatment of cirrhosis of the liver** is presented by Frederick Friedmann.[2]

John B. Roberts [3] reports 2 cases of **epiplopexy in cirrhosis of the liver.** One patient died 6 weeks after the operation. The postmortem examination showed the omentum to be adherent to the abdominal wall for about 3 inches. The second patient died in uremic coma the day following the operation. In both these cases local anesthesia was employed.

Wounds of the liver and gall-bladder are considered in a paper by J. P. Warbasse.[4] Ruptures of the liver are apt to be serious because of the plentiful blood-supply of the part and because the blood-vessels are held open by the inelastic substance in which they are imbedded. Rupture of the liver is usually complicated with injury of other abdominal organs and presents no symptoms absolutely indicative of the condition. The constitutional symptoms of hemorrhage are those upon which the surgeon must rest. It has been impossible, in the author's experience, to demonstrate the presence of free blood in the abdomen by palpation and percussion. The amount of blood which accumulates in the abdominal cavity increases the intraabdominal tension, while at the same time intravascular tension in the liver becomes less because of the loss of blood, and these two conditions will usually produce a plugging of the liver wound by a clot. Warbasse makes the suggestion that this clot may possibly act as a wedge which, when the intraabdominal pressure is increased from any cause, will produce an enlargement of the wound in the liver. This, however, is only offered as a hypothesis. Icterus is sometimes observed in wounds of the liver.

[1] Am. Jour. Med. Sci., Dec., 1900.
[2] Centralbl. f. die Grenzgebiete der Med. und. Chir., Aug. 8, 1900.
[3] Phila. Med. Jour., Jan. 26, 1901.
[4] Brooklyn Med. Jour., Feb., 1901.

The escape of bile is also observed, particularly in gunshot wounds. This, however, is a symptom which is not usually present until some days after the injury. The escape of bile into the peritoneal cavity does not at once produce peritonitis, but it is asserted that an infective peritonitis invariably takes place sooner or later. Of the 10 fatal cases of rupture of the liver occurring at the Methodist Hospital, but 2 were uncomplicated. Renfick has demonstrated that he is able to remove three-fourths of the liver of a rabbit and that the remaining fourth will undergo a hypertrophy until it attains 3 times its original size. Terrier and Anvry report 46 cases of wounds of the liver in which operation was done. Of these cases, 20 were incised wounds, 15 of the patients recovering; 14 were gunshot wounds, with recovery in 10; and 12 were contused ruptures of the liver, 7 of the patients recovering. This gives a mortality of 14 out of 46 cases. It is in the cases in which there is no external wound that surgical judgment is most necessary. With the persistence of symptoms pointing to bleeding or peritonitis after injury the surgeon must feel himself called upon to make an exploratory abdominal section. In these cases most surgeons have been too conservative. The point of greatest tenderness can be taken as an index to the seat of lesion. Attention is called to the fact that very little pressure is required to stop bleeding in the liver. Noninfected wounds of the gall-bladder should be closed; others should be drained. In cases of persistent biliary fistulas, when large amounts of bile are lost, it is suggested that an anastomosis be made between the fistulous tract and the upper part of the small intestine. Reference is made to the great value of intravenous infusion of salt solution in cases of intra-abdominal hemorrhage.

G. R. Fowler [1] presents a **historical and critical study of the surgery of the liver and biliary passages.** In this paper the history of the various operations done upon these organs is thoroughly presented.

Another review of the **surgery of the liver and gall-bladder** is given by James Swain,[2] in which he deals with the pathologic conditions rather than with the operations.

A case of **hydatid cyst in the liver which ruptured into the transverse colon** is reported by F. J. Smith.[3] The rupture in this case occurred when preparations were being made for operation. After the rupture the patient made an uneventful recovery. Smith recalls another case, in which recovery followed the rupture of a hydatid cyst into the lung.

H. Bethan Robinson [4] reports a case of **obstructive jaundice due to gummatous infiltration.** The patient was a man 35 years of age, who had had a severe attack of syphilis 10 years before. The patient gave a history of severe seizures of pain with vomiting attacks which lasted 2 or 3 days. He was observed in one or two of these attacks and a diagnosis of gall-stones was made. With each attack the patient's

[1] Brooklyn Med. Jour., Dec., 1900.
[2] Practitioner, Nov., 1900.
[3] Lancet, Feb. 9, 1901.
[4] Brit. Med. Jour., Oct. 6, 1900.

jaundice became more intense and he lost considerable flesh. When the abdomen was opened, the gall-bladder and ducts were found distended, but no evidence of gall-stones was discovered. The lower portion of the common duct entered a growth which involved the upper part of the duodenum, the head of the pancreas, and the gastrohepatic omentum. No enlarged glands were felt. It was supposed that the growth was malignant, and in order to relieve the obstruction an anastomosis was established between the gall-bladder and the colon. The colon was chosen for anastomosis because of its proximity to the gall-bladder, and because the duodenum, being bound down in the supposed malignant mass, was not accessible. After operation the patient was placed upon a course of potassium iodid, under which he made a gradual but positive recovery. [In an almost identical case in the Jefferson College Hospital it was assumed by DaCosta after opening the abdomen that cancer existed, but after cholecystotomy and prolonged drainage associated with the use of potassium iodid, the patient recovered and completely regained health and strength.]

Archibald McLaren,[1] after discussing the question of the **surgical importance of jaundice,** reaches the following conclusions: "(1) That slight attacks of jaundice are of comparatively little surgical importance, and that the majority of surgical diseases of the biliary passages have no jaundice at all; (2) that persistent jaundice, especially if progressive, is usually a contraindication; (3) while on the other hand intermittent, deep jaundice, especially if associated with chills and a rise in temperature, denotes a stone in the common duct which urgently demands removal."

Barling[2] presented before the Midland Medical Society a man 19 years of age who had recovered from a **rupture of the gall-bladder.** The patient was struck by a railway buffer. Moderate shock followed the injury, and was succeeded by mild symptoms of peritonitis and a gradually increasing accumulation of fluid in the abdomen, associated with jaundice, occasional vomiting, and, after a few days, diarrhea. On the thirteenth day the abdomen was opened and about 6 pints of pure bile flowed out. No blood was present in the belly cavity. The abdomen was closed and drained. The discharge from the wound ceased entirely in 3 or 4 days and no other abdominal symptoms developed. Subsequent to the closure of the abdominal wound, however, there developed a left pleural effusion which, when evacuated, measured 70 ounces, was bile-stained, but not purulent. The patient made a good recovery.

Taffan[3] describes a case of **traumatic rupture of the gall-bladder** which was followed 5 weeks after the injury by peritonitis. Upon admission the patient was in a very serious condition, with all the symptoms of peritonitis well marked. The effusion, however, was circumscribed in the epigastric and adjacent regions. The patient was deeply jaundiced. A large quantity of bile, pus, and liquid fecal matter was

[1] Med. News, Nov. 17, 1900. [2] Birmingh. Med. Rev., Jan., 1901.
[3] Lancet, Nov. 24, 1900.

evacuated. The cavity was quickly washed out and drainage instituted. The patient made a satisfactory recovery. It was thought that a second operation would probably be necessary to close the injury of the gall-bladder, but all discharge ceased and the wound promptly closed.

[The question of gall-stones was very generally discussed at the meeting of the American Medical Association at Atlantic City, June 5–8, 1900, after the reading of the 3 papers which follow.]

Maurice H. Richardson [1] discusses the importance of **early operation in cases of gall-stones.** It is shown that, although similar in many respects, the gall-bladder differs from the appendix in that its normal contents are sterile and infection usually occurs in parts more or less remote. This infection, too, when it does occur, affects the contents more than the walls. Changes of a malignant kind are seldom seen in the appendix, but frequently occur in the gall-bladder after chronic inflammation. Richardson says that "gall-stones should be removed from the gall-bladder as soon as their presence is reasonably sure, unless the diseased condition of the other viscera makes the hazard of the operation greater than the hazard of the gall-stones themselves." The danger of the operation of the removal of gall-stones in the hands of a skilful surgeon is less than the danger of a passage of a single stone from the gall-bladder to the duodenum. In most cases of gall-stones in which fever is present bacteria are found in the bile. In 5 cases Dr. M. W. Richardson has discovered microorganisms in the center of the gall-stones. It is asserted that, if not thus depending upon microorganisms, gall-stones certainly promote infection. Operations on the cholemic are attended by a relatively high mortality. The strongest argument which can be urged for early operation is the suffering and death which so frequently attend late surgical treatment. Even after frequent attacks of biliary colic, if there is no evidence of loss of strength, the prognosis is remarkably favorable, though extensive changes may have taken place in the gall-bladder. Not infrequently Richardson has found malignant disease of the gall-bladder, pancreas, or liver associated with gall-stones. This association is another reason why early operative interference is recommended. The author's 14 fatal cases are then briefly reported. These cases all go to show the ill effects of postponed operation in gall-stones. Many of the cases had lasted over several years, during which time serious complications, both local and general, had taken place. The diagnosis of gall-stones, unless there is some contraindication, is sufficient cause for operation. "A single attack of gall-stone colic, after which a faceted stone is found in the stools, indicates operation; but a single attack after which a single non-faceted stone is found does not. Repeated attacks of severe colic, even though stones are not found in the stools, strongly indicate exploration, especially if there is tenderness in the gall-bladder region, with fever, for stones are probably confined in the gall-bladder, or at its outlet, and the spasms are ineffectual efforts of the gall-bladder to expel them. All cases of acute cholecystitis demand operation if seen early, unless the

[1] Jour. Am. Med. Assoc., Dec. 1, 1900.

symptoms are rapidly improving, and then they require operation after the subsidence of the acute attack. Repeated attacks of gall-stone colic indicate operation, even if no stones are discovered in the stools, and even if the symptoms are so mild as not to demand it."

W. J. Mayo [1] describes a method of removing the mucous membrane of the gall-bladder as a substitute for **cholecystectomy.** The indications for excision of the gall-bladder are enumerated as follows: (1) traumatisms; (2) phlegmonous cholecystitis and gangrene of the gall-bladder; (3) malignant disease; (4) permanent obstruction of the cystic duct, the common duct being patent. In the first 3 conditions all of the coats of the gall-bladder are involved, and complete cholecystectomy must be performed. In the fourth condition, however, the mucous membrane alone is involved, and it is here that the author has found the removal of the entire mucous lining of the gall-bladder to be a very excellent and satisfactory substitute for the graver operation. Mayo illustrates with the report of cases operations for each of the enumerated conditions. Cases in which a permanent obstruction of the cystic duct is present are much more numerous than any of the other conditions. The obstruction may be due to adhesive inflammation or to the prolonged lodgment of a stone in the cystic duct, with resulting ulceration and stricture. Out of 132 operations on the gall-bladder and the bile-ducts, 11 were cholecystectomies, and 7 of these were for the relief of obstruction of the cystic duct. It is thought that obstruction of the cystic duct occurs in about 10% of cases operated upon for gall-stones. The operation which the author suggests he says is easy of accomplishment, since the separation of the mucous coat is readily effected. The operation is much more easily performed than is cholecystectomy. After the removal of the mucous membrane the other coats are sutured to the upper angle of the wound in the abdominal wall. When there exists a mucous fistula, the removal of the mucous membrane is much more difficult than at a primary operation, and in such cases Mayo recommends that an incision should be made to the inner side of the fistula, the gall-bladder opened, and through this opening the mucous membrane removed. This plan is much simpler than that of beginning the detachment of the mucous membrane at the edges of the fistula, where it is very adherent.

W. J. Means [2] presents a paper on the **diagnosis and treatment of cholelithiasis,** in which he reports 10 cases of operation for gall-stones. Stress is laid upon the fact that prodromic symptoms are nearly always present and should be taken into account in making a diagnosis. Nausea and vomiting are said to be almost constant symptoms. Attacks of colic followed by jaundice in a person beyond 35 years of age may be looked upon as the most distinctive features of gall-stones. Jaundice occasionally occurs when gall-stones are only present in the gall-bladder or cystic duct, and in these cases it is evidently due to cholangitis. The only pathognomonic symptom is the discovery of the gall-stones in the feces. It is thought that every case should be operated

[1] Jour. Am. Med. Assoc., Dec. 1, 1900. [2] Jour. Am. Med. Assoc., Dec. 1, 1900.

upon which presents symptoms indicating trouble with the gall-bladder or gall-ducts after medicinal treatment has failed to produce relief. In 2 of the author's cases he was able to make an immediate closure of the gall-bladder, with satisfactory results. The safer method, however, in most instances, is drainage.

Discussion of the Three Foregoing Papers.—Wyeth expressed absolute agreement with Richardson's paper on early operation and considered it beyond controversy. Mynter thanked Richardson for reporting his fatalities, which proved to be so very instructive. He does not approve of the method of immediate closure of the common duct after the removal of a stone. He considers continual pain and intermittent tenderness over the gall-bladder the most reliable symptoms of gall-stones. Attention is called to the difficulty frequently encountered in making a differential diagnosis between gall-stones and appendicitis. Nicholas Senn said that the x-ray could be relied upon in demonstrating the presence of phosphatic stones, but was useless when the stone was composed of cholesterin only. He did not approve of Mayo's method of extirpating the mucous membrane, preferring rather to do a cholecystectomy. He thought that too many operations for gall-stones were done at the present time, and that the medicinal treatment was not given a fair chance. Marcy took exception to Senn's remarks, and expressed the opinion that surgeons often failed to operate for gall-stones when it was their plain duty to do so. Deaver advocated early operation in this condition, as he does in appendicitis. The x-ray had not been a satisfactory diagnostic aid in his cases. Ricketts expressed absolute concurrence in the views of Richardson regarding early surgical intervention in cases of biliary calculi. Ochsner called attention to the fact that all the cases which terminated fatally were cases of long standing in which complications had arisen and the tissues had been extensively involved in inflammation. Since he has been more painstaking and careful in making a diagnosis, he has been able to relieve many more cases of gall-stones. He had found the operation recommended by Mayo a most excellent procedure, and considered the objections raised to it only theoretic. Bevan thought that it was a mistake to operate upon all cases of gall-stones, and called attention to the fact of the frequency with which gall-stones were found in the dissecting room and at autopsies. He thinks that in many of these the stones produced no serious trouble during life. He said that cases of gall-stones require a careful separation into medical and surgical classes. Summers referred to his case of anastomosis of the common duct with the duodenum, the only one reported in America.

When Shall We Operate in Cholelithiasis?—Kocher,[1] after asking this question, answers it in the following manner: In cases of recurring biliary colic indicating the presence of multiple calculi or of a single calculus too large to pass through the bile-duct, or in which newly formed calculi are passed, cholecystotomy should be performed. With the foregoing knowledge at hand it is a mistake to wait until secondary

[1] Cor.-Bl. f. schweiz. Aerzte, Apr. 1, 1900.

changes have occurred resulting in inflammation with all its possible sequels. The ideal operation consists in the immediate closure of the gall-bladder after the calculi are removed, but such a procedure requires absolute asepsis and perfect suture. Kocher uses silk, but is careful to see that the suture does not pass through the entire thickness of the gall-bladder wall, so that the danger of calculus formation about the suture is avoided. He does not think that medicinal treatment can remove calculi from the gall-bladder. Recurrence is not probable after operation, but the patient should be put upon a regulated diet.

Howard A. Kelly,[1] after referring to his plan of examining the gall-bladder when operating for diseased conditions of other organs, describes a method of **removing gall-stones** when discovered under these circumstances. A hand is passed through the abdominal incision and a careful search made of the gall-bladder and its ducts. The bladder can best be examined after its contents have been forced into the intestine by pressure. If a calculus is found, it is grasped between the forefinger and the thumb and carried to the fundus of the gall-bladder. The hand grasping the gall-bladder is then pressed firmly against the abdominal wall while with the other hand the operator makes a small incision through the gall-bladder, and removes the calculus. The edges of the gall-bladder wound are then sutured to the parietal wound and drainage instituted. The pressure of the hand within the abdomen depletes the abdominal wound at that point of blood, so that the incision can be quickly made without the inconvenience of bleeding. Kelly reports 8 cases in which he has removed gall-stones in this manner when operating for pathologic conditions in the pelvis. In 49 cases of abdominal section for other conditions, where the gall-bladder and ducts were examined, gall-stones were found in 8 %. Kelly considers the removal of gall-stones found under these circumstances justified by the distressing sequels which are apt to ensue from their presence. Dr. Mosher examined 1000 autopsy records at the Johns Hopkins Hospital and found that biliary calculi were met in 59 cases, or 5.9 %.

Bertram C. Stevens [2] reports a case of a woman 54 years of age in which **gall-stones were complicated by a cancer involving the gall-bladder, the liver, and the pylorus.** Mayo Robson operated in this case and removed nearly the entire gall-bladder together with a V-shaped portion of the liver and the pyloric end of the stomach. The growth proved to be a columnar-celled carcinoma. The patient made a satisfactory recovery, and 8 months after the operation there was no evidence of any return of the disease.

Deaver, [3] in considering the **mortality of operation for obstructive jaundice,** says that the most frequent causes of death in these cases are consecutive and secondary hemorrhage, and cholemia. In his own fatal cases he has been able to have a postmortem examination made with one exception. Robson has reported more deaths from hemorrhage than from any other cause. Of 22 deaths reported by him, 7 resulted

[1] Med. News, Dec. 22, 1900. [2] Brit. Med. Jour., Apr. 13, 1901.
[3] Am. Med., Apr. 6, 1901.

from hemorrhage, 5 from exhaustion, 4 from shock, 3 from heart-failure, 1 from an abscess between the liver and the diaphragm which was not discovered at the operation, and 2 from peritonitis. Deaver's experience agrees with Robson's in that peritonitis is not a common cause of death after operations upon the gall-bladder and ducts. Consecutive hemorrhage in these cases is due to blood-changes consequent upon prolonged jaundice. In such cases there takes place a chemic change which inhibits the fibrin-forming element and thus prevents rapid coagulation. Many of these patients die days after operation from continued bleeding. Deaver has seen but 1 death from consecutive hemorrhage. The administration of calcium chlorid in doses of 30 grains for 3 or 4 days before the operation, as well as after it, is recommended by Robson, and is thought to be good practice. In 1 case Deaver has employed suprarenal extract with seeming success. Early operation is most earnestly urged in the treatment of gall-stones. [In one case of DaCosta's bleeding continued for many hours and was finally checked by gelatin applied on the wound (Carnot's solution), but vomiting of blood began and the patient died. In another case of the same surgeon death was directly due to uncontrollable reactionary hemorrhage, and suprarenal extract, locally and internally, was useless. Both of the above cases labored under duct obstruction from malignant disease and both had been given chlorid of calcium before operation. A third case in the Jefferson Hospital under the charge of Prof. Keen died in the same manner.]

George Emerson Brewer [1] discusses the **differential diagnosis in diseases of the gall-bladder and ducts** and presents a diagnosis chart which will prove useful in differentiating gall-stones from inflammatory disease and new-growths.

The development of carcinoma after the prolonged presence of gall-stones is well illustrated in a case of **cancer of the extremity of the common bile-duct** reported by Edes.[2] The patient was a single woman, 48 years of age, who died 16 months after the first symptoms developed. At the necropsy the gall-bladder was found to contain many stones composed largely of cholesterin. The lower part of the gall-bladder was firmly adherent to the neighboring liver-substance. The biliary passages were enormously dilated within the liver. The hepatic and common ducts were also dilated to a point 2 inches from the duodenum, where there was an abrupt narrowing. At this point there was a small rounded tumor the size of a bean. The pancreas was healthy. An examination of the common duct showed the presence of a carcinoma at its orifice and a lymph-node in the immediate neighborhood. The growth was so slight that it would have escaped detection at operation, the whole amount of tissue involved being about as large as the last joint of a finger.

Frank Billings [3] reports 2 instructive cases of **gall-stones.** In the first case a man, aged 64 years, suffered from the characteristic

[1] Med. Rec., Nov. 17, 1900. [2] Boston M. and S. Jour., Mar. 7, 1901.
[3] Phila. Med. Jour., Oct. 5, 1900.

symptoms of biliary colic, but the symptoms were all referred to the left side. A careful examination of the abdomen developed the fact that there was a transposition of viscera. Christian Fenger operated upon the patient, confirming the diagnosis of gall-stones and also the anomalous position of the liver. The second case was a man 37 years of age, who had for several years suffered from attacks of biliary colic. Everything pointed to gall-stones as the cause of his trouble. There was a tumor in the region of the gall-bladder, some jaundice, chills and fever, and attacks of colic. No syphilitic lesions were discovered. Fenger operated upon this case also and found the patient to be suffering from multiple gummas of the liver. The patient made a good recovery after the antisyphilitic treatment was instituted.

Shattuck [1] formulates the following conclusions after a study of the literature relating to the **etiology of gall-stones**: "(1) A sterile foreign body does not lead to gall-stone formation, though a sterilized gall-stone may be penetrated by at least the colon bacillus. (2) The contents of the hepatic and cystic ducts, and also of the gall-bladder, are usually sterile. (3) The common duct not infrequently contains bacteria, a fact readily explicable by the relation of the duct to the intestines. (4) Gall-stones have been produced experimentally by a number of observers, with a number of organisms. Mignot failed with virulent cultures, while he succeeded with attenuated cultures, alone or in connection with a foreign body. (5) The presence of bacteria has been demonstrated in connection with a considerable proportion of cases of gall-stones. (6) The clumping of the typhoid bacillus led Dr. M. W. Richardson to think this peculiarity might play an important role, and he produced gall-stones in a rabbit by the introduction of a small amount of a clumped bouillon-culture into the gall-bladder. (7) The colon bacillus and the typhoid bacillus are the most common bacterial agents in gall-stone formation."

Ochsner [2] shows the **relation between gall-stones and appendicitis** and illustrates his remarks with a number of cases showing the difficulty which frequently arises in differentiating the two conditions.

John H. Gibbon [3] reports a case of **cholelithiasis with the formation and rupture of an abscess of the abdominal wall.** This patient was first treated for appendicitis by her attending physician. At this time all of her symptoms were referable to the right iliac fossa. There were no symptoms to indicate the gall-bladder as the seat of trouble. Some months before her admission to the hospital there developed a mass in the right iliac fossa, which ruptured externally. On admission there was a small sinus just above Poupart's ligament from which flowed glairy mucus. When this sinus was opened it was found to lead directly into the gall-bladder, from which were extracted 52 stones.

Carl Beck [4] presents a **skiagraph showing biliary calculi.** Since his first paper on this subject Beck has been able to greatly

[1] Phila. Med. Jour., Oct. 6, 1900.
[2] Phila. Med. Jour., Oct. 6, 1900.
[3] Phila. Med. Jour., Jan. 19, 1901.
[4] N. Y. Med. Jour., Mar. 16, 1901.

improve upon his former method, and now asserts that he is able by means of the x-ray to demonstrate the presence of biliary calculi, admitting, however, that the method is incomplete and needs further modification and development.

The **surgery of the spleen** is extensively discussed by J. Collins Warren.[1] The various diseases of the spleen are reviewed and their surgical treatment outlined. The frequency of simple hypertrophy of the spleen among the Armenian inhabitants of Boston, and also the fact that in southern Italy this condition is quite prevalent, is mentioned. The operation of splenectomy is said to have been done even in the most ancient times. It is said that the spleen was sometimes removed from runners for the purpose of giving them greater speed. Hagen has collected 360 cases of splenectomy, with a mortality of 38.3%. In 64 cases operated upon after 1890, in which large malarial spleens were removed, the mortality was 23.4%. Splenic anemia, or splenic pseudoleukemia, which occurs in young adult life, must be sharply differentiated from the anemias of infancy. Sippy has collected 25 cases of splenic anemia. Osler has reported 15 cases. The insidious onset of this disease and its symptoms are next described. As the tumor increases, anemia also increases, and fatigue, edema of the feet, and occasional fever develop. Bronzing of the skin has sometimes been noted. Ascites, petechias, and, more rarely still, hemorrhages from the stomach and intestines, may develop; and protracted diarrhea is a late symptom. A careful study of the blood is essential to a positive diagnosis, and here a differential count of the white blood-corpuscles is as necessary as an estimate of their whole number. At first there is a diminution of the hemoglobin and red blood-corpuscles. The coagulability of the blood is much diminished. The white corpuscles are actually and relatively diminished, and the differential estimate shows an enormous ratio between the young and the adult forms. There should be no myelocytes. Atrophy and sclerosis of the Malpighian bodies have been noted by Banti, which is in contrast to leukemia, in which disease, according to Cabot, the Malpighian bodies are increased. Osler has reported a case which extended over 10 years. Sippy regards the disease as fatal unless relieved by surgical interference. He performed splenectomy 7 times and had 5 recoveries. Osler recommends the operation only in chronic cases with recurrent hemorrhage. Warren reports a successful splenectomy for this condition. The diagnosis of splenic leukemia is made largely on the blood-count, which shows an increased number of white corpuscles with the appearance of myelocytes. Splenectomy is most unfavorable in this condition, being almost invariably followed by death. Hagen reports 42 operations with only 4 recoveries; death in nearly every instance was due to hemorrhage. Richardson reports a successful splenectomy for splenic leukemia. Hypertrophy of the spleen with cirrhosis of the liver, or Banti's disease, is next described. Banti's cases show an increase in the marrow of the long bone; beyond this there is little that is definite in the pathology of the disease.

[1] Ann. of Surg., May, 1901.

Hagen reports 16 splenectomies for Banti's disease, with only 3 deaths. Wandering spleen gives rise to serious disturbance of the stomach and may occasionally produce intestinal obstruction, while peritonitis may also result from a twisting of its pedicle. During the last 10 years there have been 43 splenectomies for this condition, with only 3 deaths. Splenopexy is not to be recommended for this condition, owing largely to the fact that the organ is usually hypertrophied and more or less diseased. Splenectomy is the proper treatment. In cases of abscess of the spleen, when the organ is surrounded by pus, or when it is not too tightly bound down by adhesions, splenectomy may be performed. When extirpation, however, means the danger of infecting the peritoneum, opening and drainage constitute the treatment. In rupture of the spleen splenectomy is to be performed, unless the rent be small and the hemorrhage easily controlled. In the last 10 years 4 cases of sarcoma of the spleen have been operated upon, with three operative recoveries and one death. Warren calls attention to the wide field for splenectomy, showing that the operation is only contraindicated in such conditions as leukemia, cirrhosis of the liver, and amyloid disease. The size of the spleen is much less a contraindication to operation than the adhesions which it has formed to surrounding organs. Warren suggests that before removing the spleen the hand should be passed under it and the organ turned over. In this way the vessels are rendered much more accessible and can be tied before the spleen is removed. The author thinks it has been shown that there is no difference in the resistance to infection from bacteria after splenectomy than before the operation. One of the results of removal of the spleen is a temporary increase in the number of white corpuscles. Enlargement of lymph-glands has frequently been noticed after splenectomy (Bolton, Warbasse), and occasionally the thyroid gland has increased in size. A report of 4 cases of splenectomy and 1 of splenopexy concludes Warren's article.

Power [1] reports the **successful removal of an enlarged and displaced spleen.** The patient was a woman 43 years old. The spleen had gradually enlarged for several years and was quite movable. Upon removal it weighed 2½ pounds. Its enlargement was due to simple hypertrophy. It is thought that this hypertrophy was due to the gradual elongation of the pedicle, which led to alterations of the vascular supply and chronic congestion of the organ. The patient was seen 12 months after the operation and showed no evidence of any inconvenience arising from the loss of her spleen.

Cocram [2] reports a case of **splenectomy for simple hypertrophy.** The patient was a woman 40 years of age. The enlargement of the spleen began 7 years before the operation. Its growth had been slow and it produced little inconvenience or suffering until 4 weeks previous to her admission, when the tumor greatly increased in size and gave rise to considerable pain and distress. Jaundice developed and the patient lost weight. When the abdomen was opened, the spleen was found quite adherent to the neighboring viscera and twisted upon its pedicle,

[1] Brit. Med. Jour., Nov. 17, 1900. [2] New Orl. M. and S. Jour., Sept., 1900.

which condition accounted for the recent development of symptoms. When removed, the organ weighed 7 pounds. The patient was considerably shocked, but recovered after the infusion of salt solution. The case illustrates the danger which may arise in enlarged spleens from twisting of the pedicle.

Two cases of **ruptured spleen** occurring in Chinamen are reported by Bell.[1] The first patient was assaulted in the early morning hours and was operated upon in the early afternoon. The spleen was found torn completely across. The organ was removed and the patient made a good recovery. The second patient was kicked in the abdomen. Little collapse was present, but the patient complained of great pain. The abdomen was opened 14 hours after the injury and the spleen was found to be so badly ruptured that its removal was necessary. Twenty-four hours after the injury the patient completely recovered from shock. On the following day, however, the patient died of cerebral complications. The necropsy showed the pedicle of the spleen to be in good condition and that the patient died from an extensive fracture of the skull extending through the petrous portion of the temporal bone.

Howard,[2] of the United States army, details a case of **rupture of the spleen** which he believes to have been spontaneous. When the abdomen was opened, it was found to be filled with blood and a large rent was discovered in the spleen. The patient's condition was so bad that a complete operation could not be performed. It was impossible in this case to obtain any history of injury, the symptoms seeming to have suddenly developed without any active cause, and there was no history of malaria or typhoid fever.

Mixter[3] reports a case of **laceration of the spleen requiring splenectomy.** The patient was a man 25 years of age, who received a blow upon the side of the abdomen. There was evidence of intra-abdominal hemorrhage and the abdomen was opened by a median incision. In washing out the blood clot a portion of the spleen came away. A transverse incision was then made to the left and the spleen found to be badly lacerated and hanging by a few shreds of tissue. The splenic artery was torn and bleeding. After ligating the vessels a gauze drain was introduced. The patient made a good recovery. There was no external mark of injury over the site of the spleen.

Moore[4] reports a **successful splenectomy for sarcoma.**

A. W. Mayo Robson,[5] in a paper before the American Surgical Association, discussed very thoroughly the subject of **pancreatitis.** The symptoms of pancreatitis are, unfortunately, not pathognomonic. Rapid loss of weight, however, is considered the most constant symptom. The symptom of fat-necrosis, as is evidenced by fat in the stools, is quite common, but does not take place until the disease is somewhat advanced. Lipuria is very uncommon. Glycosuria is a rare phenomenon and only occurs when there has been an extensive destruction of

[1] Lancet, Jan. 19, 1901.
[2] Phila. Med. Jour., May 11, 1901.
[3] Ann. of Surg., May, 1901.
[4] Internat. Med. Jour., Apr. 20, 1901.
[5] Brit. Med. Jour., May 11, 1901.

pancreatic tissue. The tissues of the pancreas, being soft and containing a comparatively small amount of fibrous tissue, are easily bruised, and Robson considers traumatism the most frequent cause of pancreatitis. Traumatism may occur during the removal of a gall-stone from the common duct. When the extension of inflammations of the mucous membrane is considered, it is a matter of surprise that inflammation of the pancreas does not occur more frequently from a primary inflammation of the bile-ducts. That a catarrhal inflammation does extend up the pancreatic duct from the common bile-duct is well known. Robson has been told by an experienced pathologist that frequently in cases of obstruction of the common duct by gall-stones it is possible to press pus from the duct of Wirsung. The essential cause of all forms of pancreatitis is bacterial infection. The determining factors, however, will be found to be biliary and pancreatic lithiasis, injury, gastroduodenal catarrh, ulcer and cancer of the stomach, pylorus, or duodenum, and such zymotic diseases as typhoid fever and influenza. Occasionally the disease occurs suddenly and without any discoverable cause. Robson mentions the frequency with which he has observed enlargement of the head of the pancreas in operations for gall-stones. The author refers to the writings of Korte, Lancereaux, Opie, and Barling, which go to corroborate the view which he expresses regarding the relationship between gall-stones and pancreatitis. Hemorrhage may occur in the pancreas irrespective of injury or of a general hemorrhagic tendency. Not infrequently hemorrhages will occur into the pancreas without any premonitory signs, the only symptoms being those of collapse. Robson's experience goes to show that there is less danger of serious hemorrhage in jaundiced patients when the jaundice depends upon gall-stones than when it depends upon pancreatic disease. Although there is undoubtedly some relation between serious hemorrhage and pancreatic disease, yet it is thought to be incorrect to speak of hemorrhagic pancreatitis. From custom this name is now frequently used when no bleeding occurs. Robson's conclusions regarding the occurrence of hemorrhage in diseases of the pancreas are as follows: "(1) That in certain diseases of the pancreas there is a *general* hemorrhagic tendency which is much intensified by the presence of jaundice; (2) that hemorrhage may apparently occur in the pancreas unassociated with inflammation, or with jaundice, or with a general hemorrhagic tendency; (3) that both acute and chronic pancreatitis can and do frequently occur without hemorrhage; (4) that some cases of pancreatitis are associated with local hemorrhage. From these conclusions, I think, therefore, that inflammations of the pancreas may be more conveniently and scientifically classified, like inflammation of other organs, as acute, subacute, and chronic, and that there is no reason to use the term hemorrhagic pancreatitis, except as a variety of acute pancreatitis, the hemorrhage being merely an accident in the course of the disease." The treatment of acute pancreatitis consists practically in the treatment of a peritonitis involving the upper portion of the abdominal cavity. In the early stages the symptoms are seldom sufficiently indicative to warrant operation. An

early operation, however, is as desirable here as in cases of perforated or gangrenous appendicitis. An exploratory incision should be made just above the umbilicus, and if the diagnosis is confirmed, the pus should be drained through an incision behind in the left costovertebral angle. Indications for treatment in subacute pancreatitis are more positive than in the acute variety, and here too there is more time for consideration. It remains true, however, that the earlier the treatment is instituted, the better the prognosis will be. Distention may be relieved by gastric lavage and turpentine enemas. The operative treatment is the same as in acute pancreatitis. In chronic pancreatitis drainage through the gall-bladder by cholecystotomy will be found to be very satisfactory. It is recommended that in operating upon the gall-bladder and ducts a free incision be made, which, when properly closed, need give rise to no fear of a subsequent hernia. Robson much prefers external drainage through the gall-bladder in these cases to the operation of cholecystenterostomy. In 22 cases in which this treatment has been instituted only 1 has died as a result of the operation, and in this case the patient was reduced to the stage of exhaustion before submitting to surgical treatment. In the other cases complete and perfect recovery has taken place, excepting 2 in which the patients died a few months after operation. [Another instructive paper by Robson on the subject of **pancreatitis with special reference to chronic pancreatitis** will be found in the "Lancet" for July 28, 1900.]

The **relation of gall-stones to acute and chronic pancreatitis** is dealt with editorially in "American Medicine," July 18, 1901, the writer discussing the foregoing paper by Robson and another by Opie, read at the American Surgical Association. Opie has shown experimentally that when bile is injected into the pancreas through its duct it will at once set up an extensive acute hemorrhagic pancreatitis. Some of the animals upon which this experiment was done died within 20 hours. Opie has shown conclusively that bile is capable of producing an inflammation of the pancreas without the aid of infectious agents. He refers also to a case of Halsted's in which this fact seemed to be proved clinically. In the case referred to a gall-stone was lodged in the diverticulum of Vater.

Barling [1] presents histories of 4 cases in which he accidentally discovered a **diseased pancreas when operating upon the gall-bladder or ducts.** In 2 of the cases no gall-stones were found, the disease of the pancreas being the only lesion. The common condition in these cases was enlargement of the head of the pancreas, with attacks of colic. It is thought that the cause of the disease was clearly an inflammation of the pancreatic duct, which, as a result, had become blocked. If the common bile-duct is not already obstructed by inflammatory changes, it is apt to become so from the pressure of the enlarged pancreas. In one of the cases an anastomosis was made between the gall-bladder and the duodenum which resulted in a cure of the jaundice and other symptoms, but the pancreas has remained enlarged.

[1] Brit. Med. Jour., Dec. 22, 1900.

George A. Peters [1] records a case of **hydatid cyst** which he believes to have originated in the **tail of the pancreas.** A careful examination of the growth before operation caused a diagnosis of cyst of the pancreas to be made. An incision was made through the back and the cyst evacuated and drained. Its contents showed the hooklets and numerous brood cysts with their attached embryos in various degrees of disintegration. Hydatid cysts of the pancreas are extremely rare. Neisser, in a series of 966 cases, did not find one in which the pancreas was the seat of the cyst. Graham, however, states that the disease is sometimes found in the pancreas.

At the Thirteenth International Congress of Medicine, Professor Ceccherelli [2] read a paper on **pancreatic surgery** in which he concluded: "(1) That emaciation, fat in the feces, sugar in the urine, jaundice, and pain were met with in most affections of the pancreas. (2) That because of its relations to other viscera extirpation of the pancreas is extremely difficult. (3) That operations are more justifiable at the small end of the pancreas than at the head. (4) Extirpation should not be attempted for tuberculous or syphilitic lesions. (5) Tumors of the pancreas are either blood cysts following injuries or retention cysts, and here the treatment should consist of excision of the cyst. The opening of Wirsung's canal and the consequent flow of pancreatic juice into the abdominal cavity must be avoided. (6) Pancreatic calculi may be extracted. (7) Necrosed fragments of the pancreas may be removed. (8) In suppurating or gangrenous conditions of the pancreas nothing should be done during the acute stage, and after abscess-formation drainage may be established through the lumbar extraperitoneal or transpleural and median supraumbilical routes. (9) Hernia caused by injury may be reduced and fixation may be performed. (10) Hemorrhage may be controlled by sutures or by ligatures, all clots being removed. (11) Experimental pathology justifies the fixation of a movable pancreas. (12) If the duct between the pancreas and the duodenum becomes obstructed, a new passage may be made for the pancreatic juice or a pancreatic fistula established. (13) Sutures through the pancreatic parenchyma are well tolerated. (14) Sutures should not pass into the pancreatic duct, as concretions are liable to form around them. (15) Regeneration of the pancreas has been observed. (16) Great development of the glands of Galeati has been observed after complete extirpation of the pancreas. The use of the thermocautery or galvanocautery is condemned in extirpation of the pancreas."

F. B. Lund [3] reports 6 cases of **pancreatitis,** and in 4 of them gall-stones were present. A definite diagnosis was not made in any of the cases. Five of the cases were operated upon and 1 recovered. One patient died 2 months after operation from inadequate drainage. Two deaths occurred from shock. Lund urges that operative treatment should be instituted as early as possible.

[1] Canada Pract. and Rev., Feb., 1901. [2] Lancet, Aug. 11, 1900.
[3] Boston M. and S. Jour., Nov. 29, 1900.

Baldwin [1] contributes 4 new cases of **primary carcinoma of the pancreas.**

Maurice H. Richardson,[2] in collecting his gall-bladder cases, has been struck with the **frequent occurrence of pancreatic tumors** discovered during **operations** for supposed diseases of the **gall-bladder** and its **ducts,** and reports briefly a number of cases.

Ninni [3] relates an interesting case of **gunshot injury of the pancreas.** The bullet entered close to the second lumbar vertebra and came out in the right epigastric region. When the abdomen was opened, 6 perforations of the small intestine and 1 of the colon were found and sutured. Blood was found oozing up from between the stomach and transverse colon on the right side. A search for its source revealed a wound of the pancreas. This was sutured and the patient made a good recovery.

At the German Surgical Society, Franke [4] recorded a case in which he had **removed the whole of the pancreas for cancer.** The patient lived for 6 months. For 18 days after the operation glycosuria was present. This case clears up the doubt as to whether a patient can live without a pancreas.

DISEASES OF THE RESPIRATORY ORGANS.

Lenart [5] reports a case of multiple **papilloma of the larynx** in which the resulting raw surface following operation was covered by skin taken from the arm of the patient by the **Thiersch method.** The grafts were held in place by rolls of sterilized gauze. The incision in the larynx closed in 2 weeks without suturing. Previous to operation a tracheotomy had been performed. Six weeks later the interior of the larynx, when examined by the mirror, appeared normal. The patient's voice was distinctly audible, although somewhat muffled.

Maurice Vallas [6] proposes making a **median osteotomy of the hyoid bone** for exposing the lower pharynx and upper larynx, for the removal of foreign bodies, neoplasms, and for the treatment of strictures. After making an incision from the symphysis of the jaw to the thyroid cartilage, the fibers of the mylohyoid muscle are separated and the hyoid bone exposed and divided. By retracting the two segments of bone an interval of 1½ inches is obtained. The pharynx may be entered above by cutting through the buccal mucosa and below by severing the thyrohyoid membrane. The tongue may be excised through this wound by first ligating both lingual arteries and removing the submaxillary glands. Through the mouth the tongue is separated from its floor and the anterior pillars of the fauces severed. The tongue is now pulled through the submental wound and the insertion to the hyoglossus muscle divided.

[1] Phila. Med. Jour., Dec. 22, 1900.
[2] Phila. Med. Jour., Oct. 6, 1900.
[3] Rif. Med., Apr. 26, 1901.
[4] Brit. Med. Jour., May 4, 1901.
[5] Pester med.-chir. Presse, No. 19, 1900.
[6] Rev. de Chir., May, 1900.

Marc Paunz [1] describes an **instrument for use during operations on the larynx** which leaves both hands of the surgeon free. It consists of an oval ring which the patient holds in the mouth. On its left side the mirror is held in place by a ball-and-socket joint, which allows it to be moved in various directions.

A. T. Bristow [2] presented to the Brooklyn Surgical Society, February 1, 1900, the case of a man upon whom 17 days before he had done a **laryngectomy and excision of the trachea as far as the second ring for cylindric carcinoma.** Tracheotomy had previously been performed for the relief of dyspnea. Under nitrous-oxid anesthesia a transverse incision parallel with the upper border of the larynx was made joining a vertical incision ending at the tracheotomy wound. The larynx was isolated by blunt dissection, the patient put in the Trendelenburg position, and the trachea cut through close to the tracheotomy wound. The trachea was then turned upward and the whole mass, including the epiglottis, removed. The pharyngeal wound was sutured and the incisions closed. He was obliged to open the transverse incision for drainage 24 hours later. The patient can now whisper loud enough for one close to him to hear. Bristow says he is convinced that many laryngeal cancers can be permanently cured by early excision, the disease being shut off from the surrounding tissues by a cartilaginous box, and glandular infection occurring late. Semon has reported 12 cases, 9 of which are free from recurrence after 3 years.

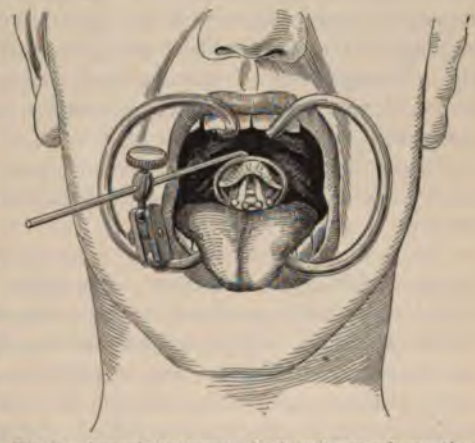


Fig. 34.—Paunz's instrument for intralaryngeal operations (Paunz, in Wien. klin. Rundschau, Jan. 20, 1901).

John Rogers, Jr.,[3] details some **experiences with tracheotomy,** reporting 7 cases. He says the operation is generally postponed to the last possible moment because of the fear of dangers and difficulties which experience demonstrates are vastly exaggerated. Asphyxia at the time of operation from inhalation of blood, subsequent sepsis and pneumonia, and contracting cicatrices are less to be dreaded than a prolonged and exhausting dyspnea. In this series of 7 cases there are 4 laryngotomies and 10 tracheotomies without a death due to operation. The most troublesome problems were the struggling of the patient, the use of an anesthetic to prevent it, and the impossibility of placing the patient in a convenient posture. An attempt was made to give ether in 2 cases, but a violent closure of the glottis followed. Cocain-anesthesia is a great

[1] Wien. klin. Rundschau, Jan. 20, 1901. [2] Brooklyn Med. Jour., Oct., 1900.
[3] Med. Rec., Apr. 27, 1901.

improvement, and should always be used when the patient is controllable, but in children or adults who cannot be restrained, chloroform should be administered. Most of the patients suffered division of the cricoid cartilage, and experience demonstrates that this invariably leads to severe cicatricial contraction if the cannula has to be worn for any length of time. Stenosis, the author believes, may be permanently overcome in every case by prolonged intubation. Laryngotomy, except for tumor, is absolutely useless. In cases of acute stenosis of the larynx where wearing a cannula for a short time may produce cure, a low tracheotomy is preferable. In chronic cases the low operation is exceedingly troublesome; the lower the fistula, the more difficult it is to pass the intubation tube by it, and subsequently to keep the lower end of the instrument from slipping out and catching in the wound. This may prove fatal unless skilled assistance is at hand. Generally the high operation is safer and better than the low, especially for emergencies and for chronic stenosis. The author does not believe that granulations resulting from the prolonged use of the cannula often give rise to serious trouble. It is not always possible to diagnosticate instantly the locality of the obstruction, as evidenced by a case of dyspnea due to pressure of an aneurysm of the aorta. If a short cannula does not relieve dyspnea, a long one should be tried, or a stomach-tube may be used as a substitute.

E. S. Goodhue [1] reports a case of **wound of the trachea with suture and union by first intention.** The patient was a would-be suicide who had completely severed the trachea between the second and third cartilages. The trachea was sewed together by a continuous catgut suture, including the inner and outer coverings of the tube. Three more stitches were then inserted to insure apposition. The external wound was closed upon a small drainage tube. At first air came through the external wound, but in the course of 3 weeks the wound was entirely healed. Later the patient ripped open the external wound with a jack-knife, exposing the trachea, which appeared to be soundly healed.

H. Milton [2] reports the **removal of a foreign body from the bronchus by intrathoracic tracheotomy.** In the "Lancet" for March 27, 1897, the author described a successful case of anterior median thoracic incision for a tuberculous tumor of the anterior mediastinum. The patient now reported was aged 40 years and had had a tracheotomy previously performed for syphilitic stenosis of the larynx. Just before again coming under observation the tubular portion of the outer silver tube had fallen into the trachea. This was corroborated by means of a long silver probe passed through the tracheotomy wound into the trachea and right bronchus, a distinct metallic click being produced. Many efforts were made to withdraw the foreign body through the tracheotomy wound without success. The patient now began to show symptoms of sepsis, as evidenced by fever and fetid expectoration. It was evident that the tube could only be removed through a tracheal incision, and

[1] Phila. Med. Jour., Jan. 12, 1901. [2] Lancet, Jan. 26, 1901.

that this incision could be made in 3 positions, in the neck, through the anterior, or through the posterior mediastinum. The opening in the neck existed already, and all efforts to remove the foreign body through it were unsuccessful. The posterior mediastinal operation seemed to present more difficulties and to offer fewer chances of reaching the foreign body, although it would afford better opportunity for drainage. The patient was anesthetized by warmed chloroform blown through a glass nozle. "An incision was made from the tracheotomy wound to the ensiform cartilage, the skin on each side was reflected outward, and the sternum and trachea were exposed. The tissues were then separated with the knife from the notch of the sternum, and the point of the forefinger insinuated as far down as possible on the posterior surface of the bone, displacing backward the trachea, innominate artery, and left innominate vein. The sternum was then sawn through in the middle line; the incision commencing at the notch, where the deep structures were carefully protected by the forefinger, was gradually carried down as far as the ensiform appendage. A chisel was inserted into the incision and rotated sufficiently to allow the introduction of two powerful retractors, with which the two halves of the sternum were dragged apart. The chief opposition to the separation was caused by the ligamentous fibers at the back of the sternal notch, but after their careful division with the knife the two halves could be freely separated, the distance between them at the sternal notch being fully 4 centimeters. The trachea was now fully exposed to the point where it was crossed by the innominate vessels, but even after these were retracted the bifurcation could not be seen. A hook was therefore introduced into the tracheotomy opening and the trachea drawn strongly upward; this maneuver, combined with the retraction of the vessels, allowed the bifurcation to be plainly seen. An incision about 2 centimeters long was then made into the anterior wall of the trachea at the lowest part exposed—*i. e.*, just above the bifurcation—and a teaspoonful of evil-smelling frothy mucus escaped and was carefully mopped up. The lips of the incision were drawn apart and a strong light thrown into the trachea toward the right bronchus; the hoped-for metallic gleam did not, however, appear. The little finger was then introduced, and its tip inserted into the right bronchus at once came in contact with the lost tube, which had become blackened and practically invisible. Guided by the finger, small forceps were introduced, but failed to get a firm hold, the difficulty being caused by the position of the upper edge of the tube, which lay imbedded in the thickened bronchial wall. Eventually the tube was made to rotate partially and was then seized and extracted without difficulty." An attempt was made to close the tracheal wound by sutures. The anterior mediastinum was drained by gauze projecting between the two halves of the sternum and the skin flaps loosely approximated by sutures. The patient died 2 days later of sepsis. In a future operation no attempt would be made to close the tracheal incision by suture. The greater part of the manubrium sterni would be removed subperiosteally, thus allowing a large opening for gauze drainage. Below this drain hole the sternum

would be sutured with silver wire. The skin incision would then be sutured and occluded by collodion, except at the site of the gauze drainage. The dangers of anterior median thoracic section are hemorrhage, shock, lesion of some vital function, and sepsis. "Of hemorrhage there is practically no risk; no important vessel requires to be severed, and the great vessels lying below the sternum are quite easily protected. Shock has been completely absent in both my cases and there seems no reason to dread its occurrence. The vital functions which might be affected by the operation are two: circulation and respiration. In neither of my cases has the heart's action been appreciably affected, and it is difficult to conceive of any wound or injury of heart or pericardium if due care be exercised. There are, however, in the immediate neighborhood the cardiac plexuses, superficial and deep, through which pass the nerves controlling the heart's action. These plexuses lie in close relation to the arch of the aorta and are not likely to be cut or directly injured. The traumatism to which they are exposed produces no gross lesion comparable to section, and brain and spinal surgery has shown us that nervous tissues of the highest importance resist the gravest lesions short of destruction if sepsis be avoided. Cerebrum, cerebellum, and spinal cord have all proved their powers of resistance; the pneumogastric has been constantly exposed, pinched, drawn aside, and otherwise exposed to surgical insult with impunity; and the cervical sympathetic has been severed and its ganglia removed. The medulla oblongata is certainly still treated with the greatest respect, and it is, of course, possible that the thoracic plexuses so closely associated with it in the maintenance of circulation are equally sensitive to traumatism. This is a point which experience only can demonstrate, but I think it probable that the slight traumatism to which they are of necessity exposed is not likely to affect them materially. The respiratory function can, on the other hand, hardly fail to be affected. The sternum is a very important element in the bony cage on whose movements respiration largely depends, but in neither of my cases has respiration been seriously interfered with. Ordinary respiration was perfectly well carried on by the diaphragm, and it was only in spasmodic efforts, such as coughing, that any difficulty arose. So long as the lungs are unaffected the results of this operation on respiration need not be feared; but should pneumonia or severe bronchitis supervene, the insufficiency of the expulsive efforts might gravely complicate the condition. An injury to the pleura at the time of operation is, of course, a possibility, but in my experience it has been very easily avoided, and did it occur it would at all events, if limited to one side, hardly produce any serious complication, and the rent could be easily and at once repaired by sutures. To my mind the only real intrinsic danger of the operation is sepsis. The mediastinum is occupied by very thin loose fibrous tissue, with imperfect blood-supply and probably very little vitality, affording, as before stated, very little resistance to microbic invasion and great facility for absorption. Moreover, the cardiac plexuses are very likely to be affected by septic inflammation occurring around them, much more so than by the trau-

matism to which they have been exposed. Drainage may be attempted in three directions—forward through the sternum, upward to the neck, or backward through the middle and posterior mediastinum. Drainage through the sternum can only be efficiently provided through holes made for this purpose. The manubrium sterni might be removed almost entirely, the periosteum being left, or trephine holes be made when required, care being taken not to injure the internal mammary artery, which is well outside the sternal limits. Drainage holes having been provided, the two halves of the sternum should be firmly reunited. Drainage through these openings is afforded by gauze plugs or specially designed glass tubes. Drainage upward to the neck might be sufficient in some cases, would be much simpler in its application, and would have the advantage that the sternal and skin flaps might be completely united over the gauze plug, leaving only a skin opening in the neck. Drainage backward through the middle and posterior mediastina is quite practicable and not so difficult as it seems at first sight. On the cadaver I have found it possible to insinuate my finger from the anterior to the posterior mediastinum, and, passing along the right side of the vertebras, to reach the third or fourth dorsal rib without injury to vein, nerve, or pleura, and by the resection of the rib from behind, between its angle and tuberosity, to create a practicable drainage route. There is, of course, considerable risk of tearing the pleura; a tear, however, in this position would be unlikely to produce any very serious effect. On the whole, I consider anterior drainage through special holes made in the sternum to be the best method, but experience only can decide the question, and the method employed must vary with the nature of the intervention."

F. B. J. Baldwin [1] reports a case of **foreign body in the bronchus.** A boy aged 5 years became asphyxiated while chewing on a beechnut. There was considerable deficiency of respiration on the left side in the region of the third rib. The next day the trachea was opened and the left bronchus searched with long forceps, but nothing could be found. A tracheotomy tube was then inserted. Seven days after operation 2 small bits of the husk of the beechnut were found on the dressing over the tube. Recovery ensued.

Samuel Lile [2] reports the case of a boy 2½ years old who **inhaled a sixpenny wire nail.** He suffered from paroxysms of coughing and dyspnea with pain in the region of the heart. Six months after the accident the nail was detected in the left bronchial tube by the x-ray. It was removed through a tracheotomy wound with long curved forceps. The nail had become encysted in the bronchial wall. Uninterrupted recovery followed. The author suggests in cases of metallic foreign bodies that extraction would be much facilitated by directing the forceps to the position of the foreign body by aid of the fluoroscope. An attempt was made to do this in the case reported, but failed owing to some disarrangement of the apparatus.

Bruce Hamilton [3] records the case of a boy aged 12 in whose trachea

[1] Lancet, Mar. 9, 1901. [2] Va. Med. Semi-Month., Feb. 8, 1901.
[3] Brit. Med. Jour., July 7, 1900.

a **haricot-bean** lodged. The right lung was found to be inactive. An incision was made into the trachea while the patient was *in extremis* and a large bean was expelled with great force.

M. Goullioud [1] reports a case illustrating the value of **the magnet in the removal of foreign bodies from the bronchi.** Through a tracheotomy wound an electromagnet was passed into the trachea and a nail about 2 inches long caught and extracted.

Francis T. Stewart [2] writes on **foreign bodies in the air-passages** and reports 12 cases. The foreign bodies found in these cases were a comb, sprigs of evergreen, a piece of raw apple, morsels of meat, a jackstone, a portion of a glass bottle, fragments of coke, a collar-button, a grain of corn, and a threaded needle. It is unusual to have more than one foreign body in the air-passages; in 2 of the cases there were 5 fragments. In 1000 cases collected by Weist the most frequent substance was a grain of corn, 177 cases; followed by watermelon seed, 109 cases; bean, 90 cases; grain of coffee, 59 cases. Following is an abstract of the cases reported: Case 1: During a fit of mania the patient pushed a hair-comb down her throat. The smooth portion had been introduced first, so that the teeth caught in the fauces. After some difficulty one side of the comb was seized with strong forceps, version accomplished, and delivery effected. Case 2: A boy aged 18 had been ill 4 weeks with symptoms of pneumonia. The expectoration was profuse, dark in color, and very offensive. Hemoptysis was frequent. He died on the eighty-fourth day of the disease, after a copious hemorrhage. On postmortem examination a cavity the size of a walnut was found in the consolidated right lower lobe. It contained 4 pieces of evergreen. A sprig of evergreen ¾ inch long projected from one of the bronchioles into the cavity. Case 3: This case was seen during a convulsion, and from the history was thought to be epilepsy. On recovering from the fit the breathing was limited and stridulous, with prolonged expiration. Asthmatic treatment was instituted. During the night he was awakened by violent cough and dyspnea, which resulted at the end of 15 minutes in the expectoration of a piece of raw apple, giving instant relief. Case 4: This patient had inhaled a morsel of meat. During an examination of the larynx the foreign body was expelled. Case 5: A child aged 2 years accidentally lodged a jackstone in the larynx. It was removed from above by long forceps. Case 6: A child aged 3 years was found bleeding from the mouth and unconscious. A low tracheotomy was performed. The patient died the next day, and the necropsy revealed a portion of a glass bottle wedged in the larynx so tightly that the vocal cords were torn in its removal. Case 7: A tramp aged 42 years gave a history of being ill 2 days after a wetting. Objectively there were fever, cough, dyspnea, cyanosis, rapid pulse, and patches of impaired percussion-note over the chest, with numerous small bubbling rales. He died 2 days later. At the necropsy several small ulcers were found just above the bifurcation of the trachea. In the right bronchus near the tracheal

[1] Independance Méd., July 18, 1900. [2] Phila. Med. Jour., Dec. 15, 1900.

opening were 3 pieces of coke, weighing 19½ grains. At a point corresponding to the position of these stones were 4 gangrenous ulcers. Two stones had been arrested in the left bronchus. No history as to how the foreign bodies entered the respiratory tract could be obtained. Case 8: A baby was tracheotomized for apnea without success. After death a collar-button, its shoulders resting on the vocal bands, was discovered blocking the rima glottidis. Case 9: This patient had inhaled a grain of corn 1 week before coming under observation. There were repeated paroxysms of cough and dyspnea. Symptoms pointed to impaction in the right bronchus. While being examined he coughed and became asphyxiated. The trachea was immediately opened, but respiration could not be induced by artificial means. An autopsy was forbidden. Case 10: This patient suddenly fell to the floor unconscious while eating. In the pharynx and upper larynx was lodged a large piece of meat. He could not be resuscitated. Case 11: This patient was a dog who, having swallowed a needle, was sent for x-ray examination. The fluoroscope revealed the needle just below the cricoid cartilage. Incision was carried down to the trachea, from which projected a threaded needle. Case 12: An old man became unconscious while eating lunch. The bystanders supposed he had a "stroke." He was dead when seen. The upper part of the larynx was filled with meat weighing 6 drams. In 6 of the 12 cases the foreign body was lodged in the larynx, 2 in the right bronchus, and 1 in the pharynx. In 1 both bronchial tubes were blocked, and in 1, Case 3, the exact site could not be determined. Expulsion was accomplished in 2 cases only. Three cases were followed by inflammatory symptoms. Five of the deaths were due to asphyxia, 3 of which were instantaneous, and 2 were due to inflammation. In 1674 cases collected by Weist, Gross, and Durham, the mortality was 57.53%. Although the symptoms are characteristic, the diagnosis is often hard to make, especially if the patient is unconscious, or is a child from whom no history can be obtained.

Whipple and Webber [1] report a case of **sarcoma of the sixth rib in the removal of which the pericardial and left pleural cavities were opened,** the apex of the heart bulging into the wound at each beat. The patient eventually recovered.

Joseph D. Bryant [2] reports a case of **traumatic empyema** in which continual aspiration was employed to promote expansion of the lung. The patient had been injured by the shaft of a heavy vehicle. The fourth rib was broken into 2 fragments, which held to the chest by the intercostal tissues only. The opening in the pleural cavity was about 8 inches in length and corresponded to the space between the third and fifth ribs. A free suppurative process soon established itself. It was determined to facilitate the return of the lung to its normal capacity by exhausting the air of pleural cavity, thus lessening the atmospheric pressure from without. After trying numerous methods to prevent the entrance of air at the site of the tube leading into the chest without success, the wound finally contracted sufficiently to allow the

[1] Lancet, Nov. 10, 1900.

[2] Med. News, July 28, 1900.

soft parts to grasp the tube tightly when suction was applied with a syringe. A stop-cock was applied to the tube to prevent the entrance of air after the syringe was removed. Afterward a collapsed rubber bag was attached to the end of the tube for the purpose of maintaining a continuous vacuum. During the earlier application of this plan the fluid withdrawn from the chest would become blood-stained. The possibility of emphysema of the lung being produced by this method was also considered. At the end of 3 months the wound had substantially healed. Bryant believes the obliteration of the cavity was greatly facilitated by the means employed, and that prolonged suppuration was prevented. He proposes in other such cases to introduce into the opening in the pleura a tube suitably surrounded with an inflated rubber collar, as seen in the accompanying illustration.

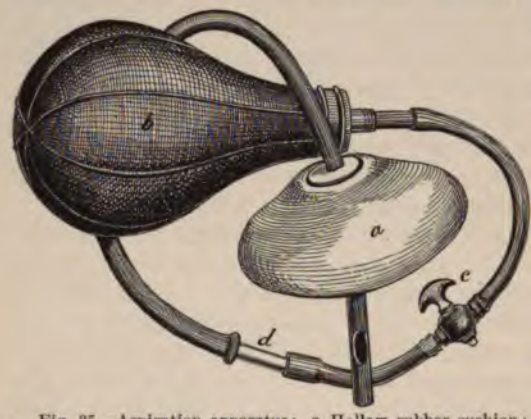


Fig. 35.—Aspiration apparatus: *a*, Hollow rubber cushion; *b*, distended rubber bag; *c*, stop-cock; *d*, glass observation tube (Bryant, in Med. News, July 28, 1900).

Herczel[1] reports a case of **gangrene of the lung** successfully treated by operation. The gangrene followed croupous pneumonia. The right supraclavicular and infraclavicular regions were absolutely dull. About a pint of fetid pus was coughed up daily. It contained fat crystals, elastic fibers, streptococci, and other organisms, but no tubercle bacilli. A curved incision extending from one end of the clavicle to the other was made. The pectorales muscles were severed and about 4 inches of the second and third ribs excised. Pus was found with the exploratory needle at the depth of $1\frac{1}{5}$ inches. An incision about 2 inches long was made into the abscess cavity, which was the size of a closed fist and contained some gangrenous lung tissue which was expelled by coughing. The sputum became less fetid, but signs of sepsis continued, so that it later became necessary to resect the fourth rib and incise the lung downward to the bottom of the cavity to establish free drainage. Recovery was satisfactory, nothing but a small sinus remaining. One-fourth of all pulmonary operations have been for gangrene and about one-sixth for abscess. Of 91 for gangrene, 60 were successful. Expectant treatment is almost invariably fatal. Concerning abscesses, he says operation is the best treatment, even though they may be spontaneously evacuated through a bronchus. The gangrene ensuing on croupous pneumonia is the most favorable form; that following influenza is less so; and that caused by perforation of the esophagus is the deadliest.

[1] Wien. med. Presse, Dec. 16 und 23, 1900.

A. M. Dodd [1] reports a **gunshot wound of the chest.** The bullet entered to the right of the ninth dorsal spine and emerged a half inch below and outside the right nipple. The chest was absolutely dull in front below the level of the nipple and behind over its lower two-thirds. The next day 60 ounces of almost pure blood was removed by aspiration.

W. W. Pitchford [2] reports a case of **abscess of the lung.** The patient had received severe injuries of the chest on three separate occasions. He had been treated for tuberculosis. The expectoration averaged about 3 pints in 24 hours. The patient expressed the conviction that the expectoration came from the part of the chest below the right nipple, which area was tender, dull, and presented no evidences of breath sounds, voice sounds, or fremitus. The expectoration was of a bright pink color, and consisted of debris, pus cells, and red corpuscles. A bacteriologic examination showed it to be free from organisms. The diagnosis being corroborated by an aspirating needle, 1 inch of the fifth rib was resected, and the abscess cavity, containing 4½ ounces of thick pus, opened by the Hilton method. The cavity was as large as a closed fist and was drained with a large tube. On the fourth day fever, cough, and expectoration returned. The expectoration was of a bitter taste. A chemic examination revealed the presence of bile. In 4 or 5 days the temperature had again become normal. Three months later the patient was in robust health.

H. Verneuil [3] discusses the **surgery of the pleura and lung.** A number of diseases of the lung and its covering previously classed as incurable are now ameliorated by surgical treatment. The diagnosis is frequently difficult. Auscultation and percussion often do not definitely localize chest-lesions. Exploratory puncture is invaluable. The expectoration may contribute much to diagnosis, but in some cases it may be abundant from a small cavity, and small in quantity from a large cavity. Exploration is justifiable in doubtful cases, the lung being palpated extrapleurally or with the finger in the pleural cavity. The importance of the x-ray is considered. In traumatic cases bleeding and pneumothorax call for operation, but the exact time to operate is frequently difficult to determine. In hemothorax operation is demanded only when hemorrhage persists, the intercostal artery being ligated or a pulmonary wound sutured. Gauze packing is not considered good treatment. He believes that empyema should be earlier treated by the Estlander operation than is the general rule. Tumors, actinomycosis, hydatid cysts, abscesses, bronchiectasis, and gangrene are also discussed.

Christovitch [4] reports a case of **pneumotomy for gunshot wound of the lung.** The bullet entered through the third intercostal space on the left side. After 4 days there were signs of sepsis with great dyspnea. After a corroborative exploratory puncture an incision was made, blood clots and pus being discharged. This pus was in the pleural cavity.

[1] Brit. Med. Jour., Apr. 20, 1901. [2] Brit. Med. Jour., Apr. 20, 1901.
[3] Ann. de la Soc. Belge de Chir., 1900, 18th année, p. 121.
[4] Rev. de Chir., July, 1900.

The rib was now resected and the lung incised, permitting the removal of the ball. Hemostasis was secured with gauze packing.

George R. Fowler [1] writes on **decortication of the lung for chronic empyema.** Decortication of the lung is a term applied to designate a procedure intended to relieve the lung from its environment in cases in which expansion is prevented or interfered with by the presence of a greatly thickened covering. The first operation of this kind on record was done by the author, October 7, 1893. "An elliptical-shaped incision was made to include the orifice of the sinus, the soft parts cleared, and about 3½ inches each of the fifth and sixth ribs removed. The greatly thickened costal pleura was then revealed firmly attached to the chest-wall and through which the sinus passed in the direction of the median line of the body. Commencing at the site of the opening in the chest-wall, the pleura was isolated by blunt dissection in the direction of the diaphragm until the latter was reached. It was then peeled off from the latter until its limit toward the median line was reached, where it was found to rest against the displaced pericardium, from which, after much difficulty, it was finally detached. This dissection was greatly impeded by the movements of the diaphragm, as well as those of the heart. The dissection was completed by lifting the mass and finally detaching it from the lung above. Considerable expansion of the lung followed at once, and in the course of 28 days this was so far complete that the normal vesicular murmur was present to the level of the seventh rib. The heart had so far receded that its apex-beat appeared well to the left of the sternum. This patient is still living and apparently in the best of health. Save for a slight sinking in of the chest-wall at the site of the resection of the ribs, there is nothing to suggest the previous existence of an empyema." Delorme, on April 3, 1893, reported to the Congrès Français de Chirurgie some experiments which he had made upon the cadaver with the view of determining the feasibility of such an operation. His first operation upon the living, however, was not performed until January 20, 1894. The history and literature of this operation are detailed, and a case reported. A male aged 19 years was treated for an empyema of several weeks' standing, about an inch of rib being resected. At the end of 4 weeks an Estlander operation was performed. At the end of another month decortication of the lung with total pleurectomy was performed under spinal cocainization. The patient proving rebellious, a few drops of chloroform were administered while the spinal injection was made. The head of the table was then lowered to facilitate the passage of the cocain-laden cerebrospinal fluid to the upper portion of the spinal cord. In a few minutes all parts of the body below the clavicle were insensible. "An obliquely placed elliptical-shaped incision 6 inches in length, running parallel with the site of the previously resected sixth rib, and inclosing a large fistulous opening and adjacent granulating surface, was made. At the anterior extremity of this incision a vertical cut 2½ inches long was made in an upward direction, and from the posterior extremity a similar cut was made in a down-

[1] Med. News, June 15, 1901.

ward direction. The 2 three-cornered flaps thus marked out were dissected from the chest-wall, including the entire thickness of the latter to the ribs. The already existing opening in the bony wall of the chest was then enlarged by the resection of 5 inches of each of the third, fourth, and fifth ribs. The attempt was made to dissect off the visceral layer of the pleura first, but this was found to be so intimately adherent that it was left until the last, and the costal and diaphragmatic pleura removed first. This was accomplished by the aid of the fingers and blunt scissors without great difficulty, when, the strongly adherent costal attachments of the visceral pleura having been loosened, the lung expanded sufficiently to bring the parts well within reach and enable me readily to dissect the visceral layer of the greatly thickened pleura from the lung, after which the entire mass came away. The 2 three-cornered flaps were then brought into place and sutured, with the exception of a small opening left anteriorly, through which was led the projecting end of a gauze tampon which was lightly packed between the base of the lung, which by this time nearly filled the entire right chest, and the diaphragm. The operation occupied 1¼ hours. The analgesia lasted up to the time of the application of the last 3 sutures, which the patient felt; otherwise the entire operation was absolutely painless. He left the table in excellent condition, considering the magnitude of the operation, with a pulse below 100 and only suffering moderately from shock. Up to the present time the patient has pursued an uneventful progress toward recovery." Visceral pleurectomy, combined visceral, costal, and diaphragmatic pleurectomy, or visceral pleurectomy with detachment, have been attempted 41 times, with 3 deaths from operation. A study of 30 cases of decortication by the method above described shows, in regard to restoration of the function of the lung, that there were 11 cured, 6 improved, 9 unimproved, 3 died, and 1 (the author's second case) in doubt, sufficient time not having elapsed since the operation. From the standpoint of cure of the empyema, there were 17 cured, 9 unimproved, 3 died, and 1 in doubt. There were but 2 cases of total pleurectomy, both done by the author. Six of the cases suffered from advanced tuberculosis. From his study Fowler presents the following conclusions: "(1) Decortication of the lung is an operation adapted to all cases of old empyema in which extensive and preoperatively discoverable tuberculous lesions of the lungs are not present, and in which the patient's condition will permit of a major operation. (2) It may be advantageously substituted for Estlander's operation in the majority of instances in which the latter has been considered, up to the present time, as being indicated, since it is a more rational procedure in that it combines the advantages of restoration of function of the lung, so far as this is possible, with closure of the empyemic cavity. (3) It should replace Schede's operation in all cases. (4) The method by extirpation of the diseased portion of the pleural membrane, including the visceral, cortical, and diaphragmatic portions, is the operation of choice. (5) Failing this, visceral pleurectomy should be selected. (6) Pleurotomy, with simple detachment of the visceral layer of the diseased

pleural membrane, gives sufficiently good results to warrant the surgeon in resorting to this procedure in cases in which the condition of the patient will not permit of the application of the other and more desirable methods. (7) Whatever operative method is adopted, as complete access to the cavity of the chest as possible should be obtained, and rapid closure of the opening in the chest-wall afterward secured, since the complete reexpansion of the lung must depend largely upon the normal respiratory movements. (8) Pulmonary or respiratory exercises should not be neglected in the after-treatment, since these aid greatly in the restoration of the function of the lung."

Tuffier [1] speaks enthusiastically of the **value of radiography in pulmonary surgery.** By the aid of the x-ray he made a diagnosis of abscess of the upper right pulmonary lobe in which auscultatory signs were negative. The diagnosis was confirmed by operation. Multiple cavities may be discovered. This method, however, may fail, particularly in the inferior portion of the chest, where the lung-shadows are overlaid by the shadows of other organs. [In a case of Prof. Hare's in the Jefferson Hospital the abscess was located by the x-rays and was successfully operated upon by DaCosta.]

Depage,[2] in discussing the **present condition of pleuropulmonary surgery,** says that when complete atelectasis follows chronic empyema, the best procedure consists in the resection of the clavicle and the first rib. Decortication may be successful, but he reminds us that carnification of the lung-tissue will preclude the expansion of this organ, even when restraining adhesions have been removed. Desquin states that the methods of Schede, Estlander, and Delorme (decortication) are rarely necessary. He advocates careful drainage, with shortening of the tube each day. A solution of zinc chlorid has been employed with good results. A febrile movement calls for irrigation. Gallet strongly favors curetage of the morbid cavity, but rarely employs irrigation. Willems believes decortication to be too severe for most of the patients. He thinks it would be better to resect the posterior portion of the lower ribs and thus drain through the costovertebral space. He considers exploratory puncture to be inadvisable, as it often fails to demonstrate pus. He employs lavage in the presence of fever and when the pus becomes fetid.

Le Moyne Wills [3] reports 2 cases in which an attempt was made to drain a **tuberculous lung-cavity.** In each case the operation was proceeded with as far as the pleural cavity, where it was abandoned because of the alarming condition of the patient. In both cases the abscess burst into the incision and drained. One patient recovered after the use of strong bichlorid of mercury irrigation. The second patient is rapidly losing ground.

S. L. Weber [4] reports a case of recovery after pneumotomy for **abscess of the lung,** the sequel of lobar pneumonia.

[1] Bull. et Mém. de la Soc. de Chir., Mar. 6, 1900.
[2] Ann. de la Soc. Belge de Chir., June, 1900.
[3] Jour. Am. Med. Assoc., Jan. 5, 1901. [4] Chicago Med. Recorder, Dec., 1900.

W. Murrell and W. Spencer [1] report 2 cases of **gangrene of the lung** treated by partial excision. Both cases followed lobar pneumonia, and in both, after rib resection, a large quantity of fetid pus and portions of gangrenous lung were removed. Both patients succumbed.

DISEASES OF THE VASCULAR SYSTEM.

J. Basil Hall [2] narrates a case of **air embolism occurring during amputation of a breast.** While dissecting out the fat and glands at the apex of the axilla, a small vein was wounded, a loud sucking sound was heard, and respiration ceased. The pulse became very rapid and a thrill was discernible over the heart. There were slight convulsive seizures, terminating in complete relaxation. Death seemed to have occurred, but artificial respiration and stimulants finally resuscitated the patient and the operation was quickly completed. Hall advises clamping all veins before severing them, especially in areas near the heart. If air enters a vein and the opening cannot be found, the wound should be at once filled with some fluid. Artificial respiration and stimulants are indicated. Unless there is collapse, cardiac embarrassment may be combated by venesection.

At a meeting of the College of Physicians of Philadelphia,[3] May 1, 1901, the **relation of diseases of the heart to surgical operations and to the use of general anesthetics** was discussed. W. J. Mayo read a paper on **preexistent heart-disease in reference to surgical operations.** The reserve power of the heart should be carefully estimated as far as possible. Although it is commonly thought that this reserve power is greater in old age than in infancy, Mayo believes the opposite view to be true. He does not support the statement that persons above the average height bear anesthetics badly. Valvular lesions are usually well compensated in individuals between 10 and 40. If failing compensation be present, only the most urgent operations should be performed before treatment has been instituted. After the age of 40 valvular lesions are usually associated with myocarditis. The most dangerous lesion is fatty degeneration. Many of the deaths occurring under an anesthetic are due to myocarditis. Some of the deaths following goiter operations are undoubtedly caused by the myocarditis incident to that disease. To know that compensation is at fault constitutes a great safeguard against danger. H. A. Hare spoke on the **safest anesthetic to use in organic disease of the heart and vessels.** He said that comparatively few persons having heart-disease died from the effect of an anesthetic as compared with the deaths from straining at stool, going rapidly up stairs, etc. The majority of the accidents in surgery are due, not to the anesthetics, but to the shock of the operation. He has seen the condition of the patient improve under the influence of the anesthetic. The question of poisoning by these drugs must be taken into consideration. Probably not more than 1 surgeon in 100 knows

[1] Lancet, Sept. 22, 1900. [2] Quart. Med. Jour., May, 1900.
[3] Phila. Med. Jour., May 18, 1900.

how much anesthetic his patient really receives. The quantity poured on the inhaler is not the true amount, and for this reason the dosage is unknown. In choosing an anesthetic the idiosyncrasy of the patient is often not taken into account. The statement of Dr. Mayo in regard to persons of overheight may apply to the hardy races of the Northwest, but it does not to people in this locality. Dr. Hare laid great stress on the condition of the vessels in regard to the use of anesthetics. Ordinarily the clinician or surgeon examines the heart, but does not investigate the cardiovascular tone, blood-pressure, etc. In many cases of high arterial tension, ether is contraindicated, although generally it is the safest anesthetic we have. American surgeons do not often enough use atropin for its effect in checking secretion caused by the anesthetic. The choice of method of giving an anesthetic is as important as the choice of the anesthetic itself. The inhaler to which a rubber bag is attached and which causes the patient to breathe his own respired air should never be used. The giving of an anesthetic by means of oxygen bubbling through it is a disadvantage. If chloroform be used, a chemic change may take place and ether is rendered more combustible. If it is desirable to increase the oxygen, the anesthetic is increased at the same time, while a decrease in oxygen means a decrease in anesthetic. Too much oxygen will produce apnea. The oxygen should be given alone and the anesthetic alone, as it is only by this means that a proper amount of each is used. Ether is the safest anesthetic except in cases of vascular disease. It is not strongly contraindicated in Bright's disease. Chloroform in cases of myocardial change is often dangerous. Nitrous oxid is contraindicated when vascular changes are present. In regard to the use of a general anesthetic in cases having valvular and myocardial disease, Dr. Hare said that the patient often improves under the use of the anesthetic. General anesthesia is better than local or spinal anesthesia. Shock to the nervous and circulatory systems is greater in the latter method, and patients have been seen to improve when it was abandoned and general anesthesia used. In Dr. Hare's opinion intraspinal injection will soon be a medical curiosity. Dr. Finney exhibited charts which he has the anesthetizer keep for each case. These show the pulse-frequency at each 5 minutes during the operation. Dr. Alfred Stengel spoke of the **cardiac complications which may arise after operation.** There is very little to warrant the belief that anesthetics will produce a heart-lesion except of the myocardium. For the immediate effect inferences should be drawn from examinations with no blood loss, and from trivial operations. In preexisting myocardial change ether is well borne. Some cases show an improved cardiac condition immediately after operation. After some days a weakness may develop. Pneumonia is often said to be due to aspiration, irritation, etc., when it is due to a failing circulation and anesthesia has been the exciting cause. Pneumonia embolism is more frequent in gynecologic cases. The heart is the predisposing cause. Myocardial disease is common in women who have myomas of the uterus. Dr. Stengel emphasized the necessity of recognizing that pneumonia, late vomiting, embolism, etc., are in

some cases really due to faulty operative technic. Dr. Ochsner, of Chicago, stated that he had never had an alarming condition from anesthesia in patients suffering from a demonstrable heart-lesion.

J. Chalmers DaCosta and J. L. Kalteyer read before the American Surgical Association, May, 1901, a paper on **the effect on the blood of ether used as an anesthetic.** An abstract of this paper is contained in "American Medicine," May 18, 1901: "The authors review the somewhat meager literature on the subject, dwelling particularly upon the writing of Mikulicz, J. Chalmers DaCosta, Von Lerber, Oliver, Dudley Buxton, Hamilton Fish, and Bloodgood. They allude to the great difference of opinion that exists as to whether or not ether causes blood-destruction. They hold that it does cause blood-destruction and that those who affirm the contrary have been misled by the blood-concentration which results from the preliminary treatment and which is often added to by sweating during the anesthetic state. This blood-concentration may mask the fall of hemoglobin; in fact, in some cases will cause an apparent rise. The important facts to note are that the color index practically always falls and that the number of corpuscles often increases. These facts prove marked blood-destruction, an increased production of corpuscles deficient in hemoglobin, resulting from ether-anesthesia. The authors report upon 50 cases in which blood-examinations were made, and subdivide these reports into numerous tables for purposes of examination and comparison. In 49 of the cases the color index was lowered. The writer also showed sections of the marrow of a rabbit's femur, the animal having been etherized to death. These sections showed marked erythroblastic proliferation. The authors conclude that the hemoglobin is absolutely reduced after the administration of ether, this reduction being manifest in the individual corpuscular hemoglobin value. The increased hemolysis is nature's effort to rapidly replace destroyed corpuscles, and the regenerated cells are imperfectly supplied with hemoglobin. The authors urge that whenever possible one or two blood-examinations should be made before ether is administered, and these examinations should be made before preparatory treatment is instituted. If less than 50% of hemoglobin is present, an anesthetic is dangerous and should only be given as a matter of absolute necessity. In malignant disease a percentage of under 50 contraindicates operation. Mikulicz says no general anesthetic should be given under any circumstances if the hemoglobin is under 30%. We believe that 40% is usually the lowest justifiable limit. If operation must be performed when the hemoglobin is under 40%, a local anesthetic should be given, except under stress of absolute necessity. It is true, cases with under 40% of hemoglobin are occasionally etherized (for instance, we know of a case with only 24%), but such cases are rare and are only justified by the imperative necessities of a vital emergency. Whenever the percentage of hemoglobin is low, the administration of the anesthetic should be entrusted only to an experienced person. As little ether as possible should be given. The surgeon should operate quickly, and prompt measures should be adopted to bring about reaction and to remove the ether from the lungs and blood."

Joseph C. Bloodgood,[1] in a paper on **blood-examinations as an aid to surgical diagnosis,** says observations have demonstrated that there is a leukocytosis of 15,000 to 24,000 following hemorrhage. This usually comes on within a few hours. There are not sufficient observations to demonstrate the relation between the leukocytes and the amount of blood lost. There is a diminution in the hemoglobin and the number of red cells. The examinations of the blood after contusion of the abdomen to ascertain whether we can distinguish the difference between shock, hemorrhage, and peritonitis from rupture are not sufficient in number to allow of positive conclusions. Most writers agree that 30 % of hemoglobin is the danger limit, and operation should be delayed until treatment has increased the percentage of hemoglobin and the number of red cells. Most authorities agree that there is, after operation, a slight leukocytosis, which disappears within 24 or 36 hours. If this is true, a sudden rise in the number of leukocytes would indicate some complication. After an abdominal operation it would indicate peritonitis, although a very grave peritonitis would soon cause a rapid fall. In intestinal obstruction there is always a rise, often above 20,000, generally within from 8 to 20 hours after the beginning of the obstruction. In a few cases this was prominent before the symptoms were clear enough to make a diagnosis. Observations after general anesthesia demonstrate that abdominal distention with a little nausea and vomiting, which seem to be due to intestinal paralysis, is not accompanied by a leukocytosis, at least not above 12,000 to 15,000. A confirmation of these observations will make the blood-count invaluable to the surgeon during the 2 days following a laparotomy. In a few cases of postoperative phlebitis the leukocytes have risen to 15,000 or 20,000 ; this has often been observed after a typhoidal phlebitis, but, on the whole, the changes in the leukocytes after operation are not well established. Within 24 hours of the beginning of an attack of **appendicitis** a count of the white cells will in most instances be of great value in determining the extent of the inflammatory condition of the appendix. Cases observed at the end of an attack, when the clinical signs are subsiding, seldom show an increase in the white cells. In a few instances, within 48 hours of the beginning of an attack, when the symptoms were abating, there have been a few counts of 15,000, which have rapidly fallen to 10,000, or even 7000, in a few hours. Bloodgood believes it is safer to operate in cases of acute appendicitis if, within the first 48 hours, the leukocytes reach 20,000. In gangrenous appendicitis the count is high and rapidly rises. Three cases are cited, in which the recognition of these facts led to an early operation, the clinical evidence being slight. One patient, a boy, suffered from an attack of pain and vomiting after eating a large quantity of indigestible food. After the stomach had been emptied there were no further abdominal symptoms. At the end of 24 hours the leukocytes were 27,000 ; in 36 hours they had risen to 35,000. Because of this rapid rise an exploratory operation was undertaken. A gangrenous appendix with a beginning purulent pelvic peritonitis was found. A second and almost similar case

[1] Am. Med., May 18, 1901.

was observed, the white cells rising from 13,000 at the end of 14 hours to 24,000 at the end of 20 hours; there were marked clinical signs in this case. In a third case with very subacute local signs the leukocytes rose rapidly from 13,000 to 23,000 in 20 hours (first count 16 hours). Within the first 24 hours of the beginning of the attack a high leukocytosis, at least above 20,000, has, in the majority of cases, irrespective of the clinical picture, been associated with an increasing diffuse or suppurative appendicitis, or a gangrenous appendicitis. Of 2 cases of abscess outside of the appendix, seen within the first 48 hours, one showed a leukocyte-count 18,000 and the other 11,000; in each the abscess was very small. Most of the cases were admitted with a history of more than 3 days' illness, and in the majority of these the count was high—16,000 to 30,000. A high leukocytosis with a history of more than 3 days' illness, especially if associated with a tumor, indicates a collection of pus. At the end of an attack, when the symptoms are subsiding, there may be a low leukocyte-count with a collection of pus, so that if one is unable to make out a tumor, it will be impossible to tell previous to operation whether there is an abscess or not. The correct interpretation of the leukocyte-count in appendicitis with **general peritonitis** is difficult because of the doubt existing concerning the duration of the peritonitis. Thus far experience seems to demonstrate that in the early hours there is a rapid rise, which soon falls. Within 48 hours of the beginning of an attack of appendicitis a very high count is suggestive, but not positive, of a beginning peritonitis. Absence of a leukocytosis with marked clinical signs of peritonitis indicates, according to the author's experience, a fatal termination. A persistent high leukocytosis seems to give a much better prognosis.

John B. Deaver[1] read before the American Surgical Association, May, 1901, a paper entitled **the examination of the blood in relation to surgery of scientific, but often of no practical, value and may misguide the surgeon.** "In the last few years there has crept into the profession a tendency to replace the bedside by the laboratory as the point from which to make a diagnosis; to substitute the highly magnified, but extremely limited, field of the microscope for the broader view of the eye of the physician. This we regret, for in the majority of instances the diagnosis must be made at the bedside without the aid of the microscopist, and any man who has no confidence in diagnosis made without the aid of the laboratory limits his usefulness." There are many chances for erroneous results. The blood-examination will not enable one to determine the exact amount of anemia from which a patient suffers. In such conditions as prolonged suppuration or frequent hemorrhages, when a profound anemia is expected, a normal or high percentage of hemoglobin and red cells is found. The blood may be concentrated from profuse purgation, excessive vomiting, or free sweating; a blood stasis from heart-disease or profound toxemia will cause a higher count than the patient's condition justifies. Deaver reports 2 cases of uterine fibromyomas in which he operated; in one the hemoglobin was 30%, in the

[1] Phila. Med. Jour., June 1, 1901.

other 22 % ; both recovered. Leukocytosis may be absent when sepsis is sudden and overwhelming, in prolonged suppuration when resistance has been overcome, and in a suppurative focus that has been walled off from the general circulation. A high leukocytosis means a good reaction ; moderate leukocytosis with severe clinical signs of sepsis suggests a bad result ; and a mild leukocytosis with slight signs of infection means nothing. Infection of a part abundantly supplied with lymphatics will give a marked leukocytosis ; peritonitis results in a greater reaction than pleurisy, and a microbic invasion of the upper peritoneal cavity in a quicker and more profound systemic infection than the lower part. Streptococcic infection should give a higher leukocytosis than an infection with the staphylococcus, yet the reaction is so dependent on the quantity of poison absorbed and the resistance of the patient that one cannot gage the character of the infection by the blood-count. Although cancer is commonly said to give a leukocytosis, only 19 out of 49 cancer cases at the German Hospital registered a count above 10,000, and only 2 of these a count over 20,000, one an ulcerating carcinoma of the breast, with 31,500, and one a cancer of the liver, with 40,800 leukocytes. In appendicitis we cannot depend on the blood-count as a guide to operation, as the most favorable time for operation is during the first hours, when the chief symptoms are those of appendiceal colic, and before severe systemic infection has taken place. We often have a ruptured appendix, or transmigration of bacteria so virulent that a leukocytosis is not established, or is very evanescent, the resisting powers of the individual being rapidly overcome. A fall in the leukocytes with an improvement in the symptoms might lead one to think that the appendix was becoming normal, when it may be that an abscess had only become localized, and no more septic absorption was taking place. In salpingitis large collections of pus are often present without a leukocytosis. Many drugs, among which are quinin, the salicylates, antipyrin, phenacetin, pilocarpin, Dover's powder, and morphin, have the power of producing quite a marked leukocytosis.

G. W. Davis, in a letter to the "Lancet," September 8, 1900, reports 3 cases in which he had used the **subcutaneous injection of gelatin** with the most satisfactory results **in cases of hemorrhage.** In each case the hemorrhage had persisted for some time and had resisted other means of arrest. The author suggests making a concentrated solution of 200 grains of gelatin in a quarter of a pint of distilled water to which has been added 1 ounce of salt. Each half-ounce, when diluted and resterilized, makes a 5-ounce injection, which is enough for one dose.

Salomoni [1] says **gelatin,** when mixed with blood outside the body, causes a soft, nonretractile clot ; when injected into the circulatory apparatus, it disappears gradually without producing a clot ; but that blood so treated coagulates a little more rapidly than normal blood. After being injected under the skin or into the peritoneal cavity it is slowly absorbed by the lymphatics and has no effect on the coagulability of the intravascular blood.

[1] La Riforma Med., 1900, No. 172, p. 254.

Racchi [1] advocates the introduction of a 10% solution of **gelatin** into the lower bowel for the **treatment of hemorrhage.** He uses about 10 drams, and claims that it is quickly absorbed, its effects being evident in from 5 to 10 minutes and lasting about 6 hours.

R. H. M. Dawbarn [2] advocates **bloodless operating.** In operations on the limbs elevation of the part with rubbing toward the body followed by the application of an Esmarch tube is advised. In operations on the lower extremity the middle of the thigh is the best point for the constricting band, thus avoiding the external peroneal nerve; in operations on the forearm constriction should be applied to the upper or lower third of the arm to avoid pressure on the musculospiral nerve. The blood-supply of the scalp may be controlled by a band applied around the head, and that of the breast by a rubber tube placed below pins passing beneath the gland. In operations on the bladder, perineum, and genitals, the Trendelenburg posture will aid in keeping the field dry. By placing cords around the extremities a large amount of blood may be segregated in the limbs and the blood-pressure in the head, chest, and abdomen lowered sufficiently to contribute to stasis and coagulation. This method is especially recommended for the treatment of apoplexy. Three limbs should be corded, and after a half hour the fourth limb should be corded and the bands removed from the first limb, thus insuring the safety of the parts so constricted. Before excising the tonsil the author passes a purse-string suture around its base. Cocain and eucain are useful in controlling bleeding in operations on the mucous membranes.

H. R. Wharton [3] presented to the Philadelphia Academy of Surgery, January 7, 1901, a paper on **wounds of the venous sinuses of the brain** based on a study of 70 cases. The sinuses are well protected and infrequently injured. The superior longitudinal sinus suffers most frequently, then the lateral, next the straight, and lastly the cavernous. Recovery occurred in 25% of the cases. Wounds of the sinuses result from direct violence, as gunshot wounds, injuries during childbirth, etc. Sometimes the hemorrhage is beneficial, preventing pressure symptoms. Intracranial hemorrhage was present in 26% of the 70 cases. Air embolism was the cause of death in 2 cases following operation. Thrombosis may occur. The symptoms are due to pressure. If the pia be torn, the blood may accumulate under the dura. Unconsciousness is not generally present. The hemorrhage may be controlled by lateral ligature, suture, hemostatic forceps, and gauze packing. Gauze packing remaining in place from 3 to 6 days is the best procedure. R. H. Harte spoke of the rarity of these injuries; in 114 fractures of the bones of the skull there was but 1 wound of a sinus. [In the Jefferson Hospital, during the last few years, there have been 2 cases of fractured skull in which a sinus was injured; in both cases it was the lateral sinus, and in each case gauze packing controlled the hemorrhage and recovery followed.]

[1] Gaz. degli Ospedali e delle Cliniche, 1900, No. 114.
[2] Jour. Am. Med. Assoc., Feb. 9, 1901. [3] Jour. Am. Med. Assoc., Feb. 9, 1901.

In a letter to the "Philadelphia Medical Journal," February 9, 1901, W. W. Keen calls attention to the importance of **trephining for intracranial hemorrhage in the newborn.** Because of the sad ravages of such a clot and the improbability of its being absorbed, Keen advises that at the earliest moment it is safe to do so, the clot should be removed by operation. He does not know of any case in which this has been done.

Bouchaud [1] reports a case of what he believes was a **wound of the left vertebral artery** following a stab of the neck. Two days after the accident unconsciousness supervened and lasted 8 days. The muscles of the neck, trunk, and limbs were paralyzed, and sensation was markedly impaired, except in the face. These symptoms slowly disappeared and finally the patient was able to walk. Bouchaud suggests that the clot from the severed vertebral artery pressed on the spinal cord and thus produced the symptoms.

Bloodgood [2] publishes a case of **rupture of the popliteal artery** in a man aged 19 years, in whom there was a dislocation of the right knee-joint posteriorly. There was no great loss of blood and no hematoma formed, the artery being plugged by a thrombus. Amputation of the leg was performed on the third day because of gangrene.

H. A. Thomson [3] reports a case of **transperitoneal ligation of the left common iliac artery for hemorrhage following exploratory incision of a sarcoma of the innominate bone.** The artery was tied with thick catgut. Bleeding ceased at once. The patient complained of cramps and loss of power in the limb after operation. Three months after operation the tumor had increased much in size, but the patient's strength was well conserved. Even after so long a time there was no pulsation in the femoral artery.

Reichard [4] details 2 cases of **suppurative pericarditis in which operation was followed by recovery.** One followed a stab wound and the other ensued on an attack of influenza and synovitis. The traumatic case was *in extremis*, so that very little anesthetic was given. The pericardium was opened without injuring the pleura after the third rib had been resected and the internal mammary artery had been tied. Recovery was complete in 6 weeks. In the second case the fourth costal cartilage was removed. Owing to the excited action of the heart, no tube was put in the pericardial cavity, but the edges of the incision in the pericardium were stitched to the intercostal muscles. Recovery was slow, but complete.

C. B. Porter,[5] in an article on the **treatment of suppurative pericarditis,** says that trephining the sternum (Riolan), approach through an intercostal space, and epigastric incision (Farrey) should be discarded, as in all of them there is danger of wounding the pleura or diaphragm. Reference is made to the various methods of approaching the pericardium. Allingham suggests making an incision along the

[1] Rev. de Méd., Nov. 10, 1900.
[2] Maryland Med. Jour., Sept., 1900.
[3] Lancet, Aug. 18, 1900.
[4] Centralbl. f. Chir., No. 44, 1900.
[5] Ann. of Surg., Dec., 1900.

lower edge of the seventh costal cartilage, separating the abdominal muscles from it, avoiding the peritoneum, and exposing the diaphragm from below. He then enters the pericardium through the cellular interval between the attachment of the diaphragm to the rib cartilage and that to the xiphoid. The pleura and peritoneum are uninjured; drainage is through the most dependent part of the sac, through a large opening not limited by bone or cartilage; and great ease of exploration and cleansing is afforded. Porter decides that operation is indicated in all cases of purulent pericarditis, and perhaps in serous effusions when aspiration, once or twice repeated, is followed by a reaccumulation. Because of the uncertain and varying relations of the pleura, and because of the anterior position of the heart whenever the pericardium is distended, he believes aspiration to be more dangerous than incision if the latter is made by an experienced surgeon. He excises the cartilage of the fifth rib, ligates the internal mammary vessels, pushes the triangularis sterni to the right, and, after introducing a needle to corroborate the diagnosis, opens the pericardium obliquely downward and outward, beginning close to the border of the sternum. He stitches the edges of the pericardium to the skin, always irrigates, and employs 2 rubber tubes for drainage. The writer collects and analyzes 51 cases treated by incision: 46 were purulent; 2 were serofibrinous following rheumatism; 1 was a hemopericardium; and 2 were serous effusions. The etiology was as follows: pneumonia, 15; periostitis, 1; necrosis of nasal bones, 1; osteomyelitis, 5; wounds, 4; blows on chest, 1; septic throat, 1; septic arthritis of knee, 1; abscess of buttock, 1; empyema without pneumonia, 5; pleurisy of doubtful origin, 2; pleurisy with typhoid fever, 1; pleurisy with bronchitis, 1; influenza, 1; tuberculosis (?), 2; unknown origin, 7; rheumatic fever and endocarditis, 3. Thirty-one patients died, a mortality of 60.5%. Of the 2 operations for simple serous pericarditis, both recovered. Of the 14 in which acute pneumonia was the cause, only 4 patients recovered; in 2 of these pneumococci were cultivated from the pus. Twenty cases were not tapped previous to operation. Local anesthesia with cocain or eucain was used in 6 cases.

Terrier and Reymond [1] have collected 11 cases in which **wounds of the heart** were sutured. Three patients recovered. Two patients died of hemorrhage and 4 with symptoms of infection. The best procedure for exposing the cardiac wound is to raise a flap composed of the cartilages of the fourth, fifth, and sixth ribs, the attached portion of the flap being placed externally. The pleura should be avoided by retracting it outward, and the wound in the heart should be closed, if possible, by a continuous suture. The lacerations in the pleura and pericardium should be closed, if possible, and no drainage employed.

Fontan [2] reports the case of a soldier who stabbed himself 6 times in the region of the heart. There were evidences of pneumohemothorax. A flap consisting of the fourth, fifth, and sixth ribs was turned outward,

[1] Rev. de Chir., Oct., 1900.
[2] Bull. et Mém. de la Soc. de Chir. de Paris, May 15, 1900.

and a wound in the lung and one 12 millimeters long in the left ventricle were closed by continuous sutures. The suturing of the **wound of the heart** was exceedingly difficult because of the tumultuous cardiac action. The patient recovered and at the end of 2 months there was no evidence of ill results from the injuries.

Lastaria [1] narrates a case of **wound of the left ventricle** which he sewed with a continuous suture. Death ensued within 24 hours.

Seegel [2] says **suturing of wounds in arteries,** including the carotid, femoral, external iliac, axillary, and brachial, has been employed 16 times. Jassinowsky, who first proved in 1889 by experiments upon animals the possibility of closure of arteries by suture, advises passing the suture through the 2 outer coats only. Doerfler believes the intima should be included in the sutures, as it renders the operation easier and it may be employed when a small artery is wounded; it also precludes the possibility of suturing too superficially and the danger of secondary hemorrhage. A suture which passes through the inner coat will be discharged externally if it cuts, and will not cause a plugging of the lumen of the artery if it remains. This question is not definitely settled, although Seegel inclines toward Doerfler's view when dealing with the smaller arteries. Whether the continuous or the interrupted suture should be employed is also an unsettled question. Bleeding from the holes produced by the needle may be checked by stitching the outer tunic over the oozing points and reinforcing this with a suturing of the sheath of the vessel. If this cannot be done, a piece of muscle or connective tissue may be stitched over the needle punctures. Longitudinal wounds $\frac{3}{4}$ inch long may be closed by suture, but when more than half the circumference is implicated, or when the artery is completely severed, an anastomosis should be performed, the proximal segment being inserted into the distal portion, slitting the distal portion to gain the requisite room if necessary (Murphy). After passing the sutures through the walls of the cardiac end of the divided artery the needle is pushed through the entire thickness of the lower segment and the upper is invaginated into the lower by tying the sutures. The coats of the central end are next stitched to the overlapping tunics of the peripheral end and the sheath is fixed over all. Murphy and Kummell have both taken the opportunity to successfully apply this method to the femoral artery after resecting a portion of the vessel. Seegel details a case of a man, aged 62, who made an effort to end his life by cutting his throat. Both the carotid artery and the internal jugular vein were wounded. The wound in the carotid was $\frac{1}{8}$ inch long and was closed by 3 fine silk stitches carried through the 2 outer coats only, the artery being compressed above and below the wound by forceps. The suturing was reinforced by 3 sutures through the adventitia and by a flap of connective tissue taken from near the injured artery. The wound in the vein was closed by 2 silk sutures. A month later there were no signs of traumatic aneurysm and pulsation in the temporal artery was normal.

[1] La Riforma Med., Mar. 22, 23, 24, 1901.
[2] Münch. med. Woch., Aug. 7 und 14.

L. L. Hill [1] reports a **needle wound of the heart.** The head of the needle could be seen to move under the skin with the pulsations of the heart. No untoward symptoms followed its extraction, which was effected through a small incision in the skin. Hill also reports a case of stab wound of the pericardium. A colored man, aged 28 years, had been stabbed in the fourth intercostal space. There were signs of hematopericardium and extreme shock. As soon as the blood was allowed to escape by extending the incision in the pericardium, the patient improved. He recovered after passing through an attack of pericarditis. Hill has collected 17 additional cases, beginning with the one of Farina, in 1896. He says the dangers from a nonpenetrating wound of the heart are shock and injury to the coronary artery. Of cardiac wounds, 90% are penetrating. The right ventricle is oftenest and the left auricle least often injured. Injuries of the auricles are more deadly than injuries of the ventricles, and injuries to the apex are the least dangerous. A wound of the heart in diastole is not so fatal as one during systole; perpendicular wounds are more dangerous than oblique ones; and the right heart bleeds more copiously than does the left heart. A large wound, a wound involving more than one cavity, multiple wounds, a foreign body in the heart, and profound syncope vastly increase the probability of a fatal issue. Pericarditis, myocarditis, endocarditis, and empyema may follow the trauma. Izzo records the case of a man who, having recovered from a stab wound of the left ventricle, died on the twenty-eighth day after the injury as a result of rupture of the cicatrix. Hill says a little over 41% of the patients treated by operation have recovered, while only 10% of those not operated upon survived the injury. For immediate hemostasis, forceps are dangerous because they tear the heart-muscle; the best method is digital pressure. The sutures should be interrupted, close together, and should pass down to, but not through, the endocardium; silk is the best material. The stitches should be inserted and tied during diastole. The initial suture may be utilized to steady the heart and facilitate the passage of the others. Ollier holds that general anesthesia is dangerous. Parazzani has twice operated without an anesthetic. The struggling which accompanies anesthesia may dislodge a clot and renew the hemorrhage, as happened in Parlavecchio's case.

Thomas Annandale [2] believes the future **treatment of aneurysms,** whether spontaneous or traumatic, if they be circumscribed and uncomplicated, will be **excision.** The advantages are: complete cure; the ligatures are applied to the ends of the divided vessels and not in their continuity; the vena comites may be divided without an inordinate amount of risk from gangrene; and inflammation and suppuration of the sac or rupture cannot occur. Diffuse aneurysm is best treated by opening the sac, ligating the vessel, and removing as much of the aneurysmal sac as possible. The author believes that subclavian aneurysm and even some cases of aortic aneurysm may be so cured in the future.

[1] Med. Rec., Dec. 15, 1900.

[2] Scottish M. and S. Jour., Oct., 1900.

L. V. Cargill [1] reports a case of **traumatic aneurysm successfully operated upon** by Parker. The aneurysm, which involved the left ulnar artery, followed a Mauser bullet wound. The injured vessel was tied above and below the wound.

J. T. Lewtas [2] reports 2 cases of **arteriovenous aneurysm caused by Mauser bullets.** In the first case the aneurysm involved the popliteal artery and vein, was about the size of a walnut, and was treated by tying the artery and vein above and below the injured point. This patient made a good recovery. In the second case there was a communication between the femoral artery and vein at the upper end of Hunter's canal. The artery was ligated above its communication with the vein. A few days later gangrene set in and amputation through the condyles of the femur was performed. The patient recovered from the amputation and pulsation did not return in the aneurysm.

Broca [3] presents a case of **cirsoid aneurysm of the scalp** in which a certain portion of the tumor seemed to be the feeding-point for the entire mass of vessels, since pressure on this point caused considerable shrinkage. A distinct thrill could be felt and a systolic murmur was audible at the feeding-point. Broca says that recent investigations seem to prove that cirsoid aneurysm is due to a pathologic anastomosis between the arteries and the veins frequently following injury. He believes that it is futile to tie the large vessels outside the tumor, and that the correct procedure is to excise those vessels which abnormally communicate. In the case reported an arteriovenous aneurysm, which occupied the site of the thrill and souffle, was excised together with the overlying skin.

W. E. Morgan [4] presented to the Chicago Surgical Society a case of **aneurysmal varix of the skull following a fracture of the base.** Three days after his head had been caught between two cars the patient regained consciousness and complained of pain and humming sounds in the right side of the head, which were noticeably alleviated when the head was raised. Several weeks later the right eyeball began to bulge, and a week after this pulsation with a thrill and bruit became evident. He was treated by subcutaneous injections of gelatin. Two hundred cc. of a 2% solution of gelatin, sterilized fractionally, was injected at 24-hour intervals for 3 days; this was repeated at intervals of 3 weeks. The patient is now free from pain, the exophthalmus has been reduced two-thirds, and the bruit is less distinct.

Carl Schlatter [5] writes on **preliminary ligation of the carotid artery in resection of the upper jaw.** He says the Trendelenburg posture is inexpedient, a preliminary tracheotomy with tamponage of the pharynx is dangerous, and operating during partial anesthesia requires great skill and dexterity, requisites possessed by few. But even in expert hands the danger of aspiration-pneumonia is great. Of 74 resections of the upper jaw, 23 patients died, and of these, 16 perished from respiratory complications (Martens); in the Greifswald clinic 4 of

[1] Brit. Med. Jour., Oct. 6, 1900. [2] Lancet, Oct. 13, 1900.
[3] Jour. de Chir. et Ann. de la Soc. Belge de Chir., No. 4, 1901.
[4] Ann. of Surg., Mar., 1901. [5] Phila. Med. Jour., Apr. 13, 1901.

18 resulted in death; in 230 unilateral resections 14% resulted in death (Bryant); Koenig gives the mortality as 30%; and of 34 resections at the Zurich clinic, but 1 death occurred from operation. Reyher was the first to write on preliminary ligation of the common carotid to anticipate hemorrhage from operations on the head; of 27 ligations of the carotid, he had but 1 death. In 1882 Weljaminow reported 20 cases of ligation of the common carotid without a death. In 1895 Senger advised temporary ligation; he has proved experimentally that this ligature may remain in this place from 1 to 3 hours. Schoenborn has produced an artery compressor consisting of 2 parallel steel bars, beak-shaped and moving in the direction of their long axes, which may be applied to an artery with the least amount of injury to the vessel. [An illustration of this compressor may be found in the "Deut. med. Woch.," 1896, page 66.] He has twice temporarily constricted the common carotid for operations on the cranial cavity with good results. In discussing permanent ligation of the carotid, he says Baumgarten has demonstrated that no thrombus follows ligation if the individual be healthy and sepsis be absent, so that softening of the brain and paralysis due to a progressive thrombosis should not follow an aseptic operation. Despite precautions, however, and notwithstanding the copious collateral circulation, this accident sometimes occurs. In a mortality of 31% in 314 ligations of the carotid, 26% had cerebral symptoms (Zimmerman); Riese found brain symptoms in 17 of 73 cases. Albert says ligation of the common carotid is well endured by a healthy person; among his ligations for neuralgia the mortality was 3%. Eberth and Schimmelbusch tied the femoral artery of a dog with silk; this was removed in 15 minutes and the circulation allowed to continue for three-fourths of an hour. On section the intima was found completely torn and the other coats less extensively damaged. Concerning the ligation of the external carotid, Schlatter says this would be the ideal solution of the problem if we could ignore the question of ligation of the common carotid. Of 130 cases of ligation of the external carotid, there were only 2 in which the thrombus extended into the internal carotid artery (Lipps). The question whether the common or external carotid should be ligated is not yet settled among surgeons. Friedlander states that ligation of the common carotid is performed in more than one-half of the cases presenting disease in the region of the external carotid. Schlatter reports 3 cases. In the first, a sarcoma involving the right jaw and part of the left, he temporarily ligated the right common carotid artery with a thin rubber tube before proceeding with the resection; hemorrhage was moderate and chiefly venous. In the second case, a carcinoma of the right superior maxilla, he placed a temporary ligature around the external carotid, and attempted to remove the growth, but on account of the excessive hemorrhage he was forced to tie the common carotid. The third patient also suffered from cancer of the right upper jaw. The right external carotid was tied and the hemorrhage was slight. These cases do not settle the question; on the contrary, they prove that in some cases ligation of the external

carotid will suffice, but that in others it is necessary to tie the common carotid. He advises ligation of the external carotid in most of the cases, ligation of the common carotid when imperative in exceptional cases, and an exposure of the bifurcation of the carotid in all cases in order to remove the lymphatic glands in this region, which are generally attacked by metastasis.

Burton S. Booth [1] reports a **traumatic aneurysm of the internal carotid artery** resulting fatally from rupture into the pharynx. The aneurysm occupied the left nasopharynx, reaching as far as the mesial line; it was painless, pulseless, and extremely hard to the touch. The left eye was paralyzed, the hemoglobin and red cells were diminished and the leukocytes increased in number.

Francis T. Heuston [2] reported to the Royal College of Surgeons of Ireland, March 30, 1900, a case of **idiopathic axillary aneurysm** cured by **ligation of the third part of the subclavian artery.** Strong catgut was used and drawn only sufficiently tight to occlude the lumen of the artery. Three months after operation bruit, pulsation, and pain are absent. Although the radial pulse cannot be felt, the patient has perfect use of his arm.

G. A. Wright and P. R. Wrigley [3] report a case of **left subclavio-axillary aneurysm** in which **ligation of the second part of the subclavian artery** was followed by recovery. Two months after operation the swelling was firm, hard, and nonpulsatile, and there was slight pulsation of the radial artery.

S. C. Graves [4] proposes a **new guide for the ligation of the subclavian artery** in its third portion. He says the old guides, the tubercle on the first rib and the anterior scalene muscle, are difficult to expose, and that the brachial plexus, where it narrows opposite the clavicle, is a more reliable and more easily found landmark, the artery being to the inner side and just behind it. He describes a triangle in which the artery always lies. It is bounded externally by the cord of the brachial plexus, internally by the scalenus anticus, and below by the first rib.

Le Dentu [5] reports a case of **aneurysm of the innominate and right subclavian arteries** completely cured by the Brasdor operation. The patient had been subjected to gelatin injections, which lessened the pain, but failed to stop the growth of the aneurysm. The axillary and carotid arteries were ligated.

A. R. Hernandez [6] **ligated the innominate artery** for hemorrhage following a laceration of the common carotid. The patient recovered.

S. P. Delaup [7] publishes a case of **ligature of the innominate artery for aneurysm.** The patient was a negro, aged 58, who had suffered with pain in his shoulder for 5 months and had noticed throbbing in the upper part of the right chest for 2 months; soon afterward he lost power in the right arm. On examination an aneurysm was found

[1] N. Y. Med. Jour., Nov. 24, 1900.
[2] Dublin Jour. Med. Sci., Nov., 1900.
[3] Lancet, June 22, 1901.
[4] Med. Rec., Oct. 6, 1900.
[5] Bull. de l'Acad. de Méd., July 24, 1900.
[6] Wien. med. Blätter, Aug. 30, 1900.
[7] Phila. Med. Jour., Jan. 26, 1901.

behind the right pectoral muscles. His arteries were sclerotic, the urine albuminous, and two murmurs were heard over the heart. Under chloroform an attempt was made to ligate the third portion of the subclavian artery, but this, together with the second part, was found to constitute a portion of an aneurysm which also involved the axillary artery. The incision was prolonged inward, the sternomastoid, sternohyoid, and sternothyroid muscles were divided, and the inner third of the clavicle, with half of the manubrium, excised. A second aneurysm, a fusiform dilation of the innominate involving its bifurcation and extending up the common carotid, was found. The first portion of the subclavian artery was hidden behind this aneurysmal tumor and could not be exposed; to the finger it felt normal in size. A ligature of kangaroo-tendon was placed on the innominate artery a little over an inch from the aorta; it was tied firmly, but not with enough force to rupture the coats of the vessel. A ligature of kangaroo-tendon and one of silk were applied about three-quarters of an inch from the aorta. The operation lasted over 2 hours. A slight pulsation was noticed in the radial artery 4 hours after operation. There was considerable mental hebetude alternating with delirium. On the second day pulsation returned in the tumor. On the twenty-first day a slight hemorrhage occurred from the wound, and it was decided to tie the common carotid and vertebral arteries, as secondary hemorrhage in these cases usually comes from the distal end of the artery. Chloroform was again administered and both arteries tied. The patient expired as the incision was being closed. At the autopsy the kangaroo ligatures could not be found. The silk ligature had ulcerated its way into the lumen of the artery, but the fibrinous ring around the severed artery had sufficiently organized to prevent hemorrhage, so that circulation through the artery had become reestablished. The second rib was partially absorbed, and the suprascapular artery and branches of the thyroid axis were markedly enlarged. The author says that gelatin treatment, from which so much was expected because of the French reports, has proved a failure. The passage of a coil of wire into the sac with electrolysis is worthy of a further trial. Amputation of the arm with ligature of the artery close to the sac (Ferguson) has been performed 5 times with 2 recoveries. A table of 34 ligations of the innominate artery is given. Five patients recovered; 1 lived 10 years, dying from the rupture of a reformed aneurysm the result of reverse collateral circulation; 1 lived 42 days; 1, 43 days; 1, 68 days, and 1, 104 days.

B. B. Gallaudet[1] reports a case of **aneurysm of the common carotid artery treated by excision.** The aneurysm followed a pistol wound received 16 years before. Medicinal treatment had been unavailing, so operation was decided upon. A flap consisting of the sternomastoid, inner half of the clavicle, and the adjoining portion of the sternum, was raised and the aneurysm exposed. The first rib was then resected as far out as the subclavian vein in order to obtain sufficient room. The operation had thus far consumed 4 hours, and was discontinued because of the desperate condition of the patient. Five days

[1] Am. Jour. Med. Sci., May, 1901.

later the carotid was tied about one-fourth inch from its origin. The flap could not be replaced owing to the enormously enlarged aneurysm, so it was decided to extirpate the sac. During the operation the patient died.

De Forrest Willard [1] reported to the Philadelphia Academy of Surgery a case of **traumatic thoracic aneurysm treated by the introduction of wire and the passage of electricity.** Dullness extended from the right clavicle to the right axilla, over which area a systolic bruit existed. By means of a cannula about 20 feet of silver wire, No. 25, was introduced into the aneurysm. Blood rushed out with each heart-beat until the galvanic current was turned on—40 milliamperes, increased 5 milliamperes every few minutes until 80 milliamperes had been reached, continuing for 1 hour. The patient improved, and at the end of 2 weeks the aneurysmal sac had diminished one-third in size. [Willard reported the death of this patient 6 months later.] D. D. Stewart, in discussing this question, said that it was his custom to penetrate the thinnest portion of the sac with a cannulated needle and then to introduce 2 or 3 feet of gold or silver wire in several different directions. The object is to coagulate the albumin and to dissociate the watery elements of the blood by means of electrolysis. He begins at zero and increases every few minutes until a strength of from 65 to 80, or even 100, milliamperes has been reached. He believes that iron wire would cause too much detritus. One of his patients survived 3 years, dying of some other disease. [The great advantage to be derived from entering the cannula through the thinnest portion of the sac is not obvious. It would seem more reasonable to enter it through a thicker portion.]

Arthur Cutfield [2] reports a case of **thoracic aortic aneurysm treated by gelatin.** The aneurysm occupied the right chest. Every second day a 2% solution of gelatin was injected into the subcutaneous tissues of the abdominal wall. Three ounces was used for 4 injections, and after this 4 ounces was given. After 3 weeks the injections were given every third or fourth day, 20 in all being employed. Improvement began at the end of 2 weeks, and was very marked when the treatment was discontinued.

Leonard Freeman [3] presented to the Denver and Arapahoe Medical Society a patient with **aneurysm of the innominate and aorta.** He inserted into the aneurysm 5 feet of **silver wire,** through which 75 milliamperes of electricity was passed for half an hour. At the beginning of the treatment the clavicle was dislocated from pressure and dyspnea; aphonia and eye symptoms were present. After treatment the voice returned, dyspnea disappeared, and the tumor is now imperceptible. Gelatin and potassium iodid had been tried without effect.

Golubinin [4] believes the **gelatin treatment of aneurysms** is much less efficacious than its advocates assert. Of 8 cases of aortic aneurysm in which he had employed this treatment, 4 patients succumbed soon after the beginning of the treatment and 4 could not be traced. In 3

[1] Jour. Am. Med. Assoc., Mar. 2, 1901.
[2] Brit. Med. Jour., Nov. 24, 1900.
[3] Jour. Am. Med. Assoc., Feb. 9, 1901.
[4] Brit. Med. Jour., Oct. 13, 1900.

of the latter no beneficial effects were noticed, and in the other one there was slight improvement in the symptoms, but no change in the signs.

Tillaux [1] reports a case of **ligature of the aorta** for aneurysm of the left external iliac artery in a man 56 years of age. Through a median incision below the umbilicus a large artery, which fed the aneurysmal tumor, and which was believed to be the common iliac artery, but which afterward proved to be the aorta, was tied. The mass again pulsated and grew in size. There were no untoward symptoms for several days, and then the patient began to emaciate and showed signs of vascular obstruction in the lower extremities. Death occurred on the thirty-ninth day, and was independent of the operation. There was no ulceration at the point of ligature.

W. W. Keen [2] publishes a case of **ligature of the abdominal aorta just below the diaphragm.** The patient was a man aged 52 years, who had complained of severe epigastric pains for 2 months. Halfway between the ensiform cartilage and the umbilicus was a tumor nearly 7 centimeters in diameter, presenting the characteristic signs of an aneurysm. Later this aneurysm ruptured and a large hematoma developed beneath the peritoneum on the left side of the abdomen, extending from the costal margin to the iliac region and 3 centimeters to the right of the median line. The abdomen was opened, but owing to the huge size of the clot and the certainty of a fatal result if it were disturbed, the incision was closed and hypodermic injections of gelatin administered. As this treatment failed to better his condition, it was proposed again to open the abdomen and wire the sac, but the facts found at operation led the writer to ligate the aorta. Through an incision extending from the ensiform to the umbilicus the aorta was tied between the stomach above and the pancreas below, the space available being about 5 or 6 centimeters. Pulsation in the sac and in the femoral artery ceased, and the face became intensely livid ; this subsided in a few hours. On the eighth day pulsation was detected in the femoral artery and the bruit was perceptible. Gelatin injections were again administered. The mass in the abdomen increased markedly in size until the forty-eighth day, when the patient died from hemorrhage, the ligature having cut through the aorta. Keen gives a résumé of 12 other cases, including the one by Tillaux epitomized above. In his own case there was no evidence of interference with sensation or motion of the lower extremities. After the first few days the urine increased to the normal quantity, although the ligature had been applied above the renal artery. The nutrition of the lower limbs was never impaired. Because of the danger of ulceration and rupture from total occlusion of the aorta by a ligature, Keen proposes applying, in suitable cases, an instrument that will compress the aorta through an incision in the abdominal wall. This instrument consists of two parts : First, a shank with a horizontal plate which passes at right angles

[1] Bull. et Mém. de la Soc. de Chir. de Paris, May 8, 1900.
[2] Am. Jour. Med. Sci., Sept., 1900.

to the shank behind the aorta. The aortic surface is roughened to prevent slipping. Second, a second shank with another horizontal plate, which can be introduced separately and fastened to the shank of the first piece by slipping the narrowed portion under the two projecting teeth of the first shank. This upper horizontal plate is also roughened on its under side and provided with a lip which overlaps the lower plate, the object of this lip being to prevent the slipping of the aorta from the grasp of the instrument. By experiments on dogs Keen shows that paralysis of the hind legs follows complete obliteration of the aortic stream; that the paralyzed parts may regain their entire health even after 48 hours' compression; that 3½ hours of compression will not interfere with complete restoration of the paralyzed parts; that at least after 24 hours the collateral circulation may reestablish the continuity of the circulation; that the aorta may be clamped in the dog for 110 hours and yet the collateral circulation be established sufficiently to nourish the posterior extremities; that the clamp can be placed on the aorta either in separate parts or as a whole, and that it can be readily removed without injury to the aorta.

A. E. Maylard [1] gives the history of a case of **aneurysm of the abdominal aorta** in which the initial symptoms were those of chronic colitis. The performance of inguinal colostomy was under consideration when a pulsating swelling appeared in the left lower dorsal region. Death soon occurred from rupture of the sac.

Rudolph Matas [2] writes on the treatment of **abdominal aortic aneurysm** by a preliminary exploratory laparotomy and peritoneal exclusion of the sac, followed at a later sitting by wiring and electrolysis, and reports 2 cases. Case 1 was a spontaneous aneurysm in the upper celiac region in a man aged 23 years. An exploratory operation was performed and the aneurysm, which was as large as a full-term fetal head and situated behind the pancreas and duodenum, was stitched to the anterior parietal peritoneum by partially detaching the pancreas and thus clearing a space between it and the stomach. The patient was put on the Tuffnell treatment, codein and cardiac sedatives. Later, 12 ounces of a 10% gelatin solution was injected into the left subscapular region. This injection caused intense pain, and the temperature quickly rose to 105°. It was not repeated. About 1 month after the laparotomy Macewen's method of needling was tried, but the patient continued to decline, and wiring with electrolysis was performed after anesthetizing the cicatrix with Schleich's solution. A cannula insulated with shellac was introduced into the sac and 10 feet of silver wire of about a No. 28 gage passed through the cannula into the aneurysm. The electrolytic sitting lasted 4 hours and 20 minutes; the galvanic current was slowly increased to 75 milliamperes, and at one time the milliamperemeter registered 210. The tumor retracted and gave evidences of undoubted improvement anteriorly, but it progressed posteriorly and perceptibly bulged in the left lumbar region. The patient died 19 days after the wiring, from rupture of a huge diverticulum of

[1] Brit. Med. Jour., July 28, 1900. [2] Am. Med., June 22, 1901.

the original sac, which was fusiform in shape, much contracted, and undergoing a process of obliteration. Case 2 was operated upon by F. W. Parham in 1896. The sac was exposed by an opening in the median line, and 26 feet of fine steel wire introduced through a cannula. Death occurred on the forty-fifth day. At the autopsy the wire was found extending along the thoracic aorta into the left ventricle of the heart; a point of wire could be felt protruding through the wall of the descending aorta just below the arch; the sac was ruptured at its lower part, and the aneurysm was not visibly affected by the presence of the wire. Matas has collected 15 cases treated by wiring or by wiring combined with electricity. Three of these patients have been cured (Morse, Noble, Langton). In the 12 fatal cases the cause of death was as follows: In Loreta's case death occurred on the ninety-second day, from rupture of the aorta below the former aneurysm, which was found filled with a firm clot. Lange's patient died on the twelfth day after wiring, from pneumonia and exhaustion; the aneurysm had partially ruptured before the operation and had remained active, and was uninfluenced by this procedure; Stevenson's patient (superior mesenteric artery involved) lived only 27 hours after the operation, death being caused by direct hemorrhage following the operation; Stewart's abdominal thoracic case (No. 1) was fatal in 9 days, from rupture of the sac; Stewart's second abdominal case terminated fatally on the fifth day, from hemorrhage and other complications resulting from perforation of the aorta with wire; Parham's patient died 45 days after the operation, from exhaustion, hemorrhage, and the effects of penetration of the wire into the thoracic aorta and left ventricle of the heart; Reeve's case ended in death 24 hours after the operation, from interference with the circulation caused by penetration of the wire into the thoracic aorta as far as the aortic valves; the author's patient died 19 days after wiring and coagulation of the sac, from rupture of a secondary diverticulum or pouch; Halsted's patient died 40 hours after operation, from rupture of the sac into the pleural cavity; Finney's first abdominal case died on the twentieth day, from hemorrhage and exhaustion, the upper part of the small bowel being of a chocolate color because of the obliteration of the aneurysmal portion of the superior mesenteric artery by clot; and in Pringle and Morris's case death occurred on the fifth day, from delirium and asthenia. The objections to this method (Moore-Corradi) are: The cure of the aneurysm may lead to the death of the patient by obliterating some important visceral artery, especially in the upper or celiac region—*i. e.*, in about 50 % of the cases; secondary rupture of the sac from the strain put on its weak portions in multilocular aneurysms; danger of a stiff wire perforating the sac or escaping into the aorta or even into the heart; danger of the clot blocking the aorta and leading to gangrene of the lower extremities; danger of rupture of the sac from the sudden withdrawal of abdominal support and displacement of adherent organs in the course of an exploratory laparotomy; danger of operating on a fusiform aneurysm, of emboli or thrombi following incomplete coagulation of the blood in the sac; the dangers of shock and sepsis.

The following rare conditions are favorable to the employment of this method: A unilocular, saccular aneurysm with fairly strong walls in a young or middle-aged healthy individual; the orifice of the aneurysm should be small and the aneurysm should spring from the aorta below the origin of the superior mesenteric artery; if given off above this, the orifice should be situated on the posterior or lateral wall of the aorta. But as the most important of these conditions cannot be determined by an exploratory operation, the writer concludes that the procedure is most dangerous, its only recommendation resting on the fact that 3 cases have been saved by its employment.

Guy L. Hunner [1] says **aneurysm of the aorta** is a surgical disease. He reviews the various methods of treatment which have proved unsatisfactory in the past. Concerning the gelatin method, he says the brilliant results reported by the French have not been confirmed in the Johns Hopkins Hospital. He gives an abstract of all the cases treated by wiring alone (Moore's method), 14 in number, and an abstract of those treated by passing electricity through a permanent wire (Moore-Corradi method), 23 in number. Of those treated by the Moore method, 3 resulted in cure, but 1 of these died from rupture of the aorta. An autopsy was held in 9 cases, and in all the effect of the wire in whipping out fibrin was marked. With the Moore-Corradi method there have been 4 cures (3 thoracic and 1 abdominal). Rosenstirn's patient is well after 11 years; Stewart's second case was a definite cure, as shown by autopsy more than 3 years after operation; Kerr's second case was lost sight of 10 months after operation, and Noble's patient died at the end of 8 months, from another disease. In 9, or 39%, the symptoms were ameliorated and the patients enjoyed a prolongation of life. Death was probably hastened in the remaining 10 cases. Hunner uses a cannula insulated with French lacquer, which is sterilized by dry heat. After considerable experimentation he found wire made of 75 parts copper to 1000 parts of silver to be best. Never should the sac receive both poles, nor should the current be so passed that the negative electrode is in the sac. From 10 to 20 feet of wire may be used. Into fresh clotted hog's blood a current of 100 milliamperes was passed; around the negative pole there was a rapid formation of water and an active ebullition of gas-bubbles; around the positive pole was an adherent black coagulum, more marked on a silver than on a steel wire. To determine the effect of different currents on the aortic wall, currents of 100 and of 20 milliamperes were passed through the wires inserted into the aorta of 2 dogs. Both wires collected the same amount of fibrin, but the aortic wall subjected to the stronger current showed decided destruction wherever the wire came in contact with it. The author is convinced that the current generally used is much stronger than is necessary. In the case of a wire left in the aorta for an hour with no galvanism, the wire collected no fibrin. Clinical and postmortem evidence points to the efficacy of this method; its great drawback is the difficulty of diagnosticating the favorable cases. Many of the operations have been of the nature of surgical adventures,

[1] Bull. Johns Hopkins Hosp., Nov., 1900.

but on the whole the results have been good in an otherwise hopeless condition.

Henry Morris [1] has collected from literature 21 cases of **aneurysm of the renal artery.** In 2 the particulars were not obtainable; of the remaining 19, 12 were traumatic and 7 spontaneous. Traumatic aneurysms are either small and sacciform, and composed of some or all of the coats of the artery, or are large, the walls being formed of condensed fibrous tissue developed around extravasated blood. False aneurysms develop from the giving way of a small true aneurysm, from the yielding of a thrombus which temporarily closes the rent in a ruptured artery, and from the immediate outpouring of blood from a ruptured artery. Of the 12 traumatic cases, 2 were sacciform, 9 were false, and 1 was doubtful; of the 9 false aneurysms, 2 developed from the bursting of a sacciform aneurysm, 1 from the yielding of a thrombus in a ruptured artery, 5 as an immediate consequence of a ruptured artery, and the nature of 1 is not described. Of the 7 spontaneous cases, 3 were sacciform, 3 false, and in 1 the description is not given. Ten of the 12 traumatic cases were in males. The age of the youngest patient was 15 years, the oldest 66 years. The causes were falls and crushing accidents. The spontaneous cases were associated with disease of the heart in 1, arteries in 2, kidney in 2, and in 2 no cause was found. An unruptured sacciform aneurysm gives no symptoms and does not seem to produce any changes in the kidney or in any of the surrounding parts. If it burst into the renal pelvis, blood may flow from the urethra. A false aneurysm produces serious damage to the kidney and surrounding organs by pressure. The contents of the sac are mostly blood clot, so that not more than 1 or 2 drams can be drawn off when the tumor is tapped. There may be urine in the sac. An unruptured sacciform aneurysm is only discovered postmortem in a patient who has died from some other disease. A false aneurysm always produces a tumor and nearly always gives rise to hematuria. The tumor is neither irregular nor nodulated, is very slightly movable, and it rarely moves with respiration, though in several cases there has been some mobility in an anteroposterior direction. Pain and tenderness are usually absent, but may give rise to excruciating agony. Pulsation is rarely present. Auscultation was employed in but 2 cases. In 1 a loud systolic bruit was detected and in the other bruit was absent. Except for the presence of blood, the urine is normal. Dysuria and frequency of micturition may occur when blood clots are passing. In the absence of pulsation there is no way, except by an exploratory operation, to distinguish a simple hematoma or a true hematonephrosis due to a ruptured vein or ruptured renal parenchyma, from a primary false aneurysm. All the patients not operated on have died. Four have been operated upon, and of these, 3 recovered. The treatment will usually be an exploratory operation through the loin. As soon as the nature of the tumor is discovered the lumbar incision may be prolonged considerably forward, or, what is better, the patient may be turned over

[1] Lancet, Oct. 6, 1900.

and the kidney removed through the peritoneal cavity. The nature of the tumor will not be revealed on exposing the sac, a small incision into the laminated clot being necessary. The operation is both difficult and dangerous.

S. W. Miller[1] records a case of **aneurysm of the spermatic artery simulating an inguinal hernia.** The patient presented a swollen and bluish scrotum on the right side. He had worn a truss for some months. There had been no vomiting, but the stools were small and accompanied with tenesmus. The scrotum and testicle, both of which were gangrenous, were removed, and the cord amputated at the internal ring. The patient died the same day. At the autopsy an aneurysm of the spermatic artery about the size of a goose's egg was found just within the internal ring.

Wallace Neff[2] reports a case of **ruptured traumatic aneurysm of the femoral artery due to gunshot wound.** A proximal ligature was applied just above the aneurysm, which was in Hunter's canal, and about the size of a duck's egg. Recovery followed with good collateral circulation. "The 'Medical and Surgical History of the War of the Rebellion' (surgical vol. II, part III) states that there were 58,702 cases of shot wounds of the soft parts of the lower limbs. As nearly as can be approximated, 26,000 were in the thigh, about 21,000 in the leg, and about 10,000 in the foot. Of this number, only 156 instances of injury of the large blood-vessels of the lower extremity, or 2.6 % per thousand, were reported. In a summary of 127 cases of ligation of the femoral, for hemorrhage unattended by fractures, there were 91 deaths, a mortality-rate of 71.7 %. There were 74 cases of traumatic aneurysm of different arteries, with 23 recoveries and 51 deaths, a mortality of 68.9 % ; 42 of the 74 cases were treated by ligation, of which number 13 recovered and 29 died. In 32 cases there was no ligation, with 10 recoveries and 22 deaths. Of the 74 traumatic aneurysms, only 20 involved the femoral, with 5 recoveries and 15 deaths. In 16 of the 20 ligation was employed, with 5 recoveries and 11 deaths. In 4 cases there was no ligation, and all the patients died. It will thus be seen that there were only 5 cases of traumatic aneurysm of the femoral during the Civil War in which the patient's life was saved. In the 'Medico-Surgical Aspects of the Spanish-American War,' Senn reports 2 cases of traumatic aneurysm on the 'Relief,' one an aneurysmal varix, the other an aneurysm of the femoral. Neither was operated on, apparently. . . . In the 'Report of the Surgeon-General for 1900,' 2 cases are recorded during the year 1899 of ligation of the femoral for flesh wounds ; in one case the patient recovered (a Mauser wound) ; in the other he died (a Remington wound). In the same report a case of traumatic aneurysm of the femoral due to a Mauser wound is found. The external iliac was ligated, and 4 days later the leg was amputated at the hip-joint. Patient recovered. The reports of the Anglo-Boer war are incomplete as yet. H. T. Cox[3] reports an aneurysmal varix of the femoral artery and vein,

[1] Phila. Med. Jour., Nov. 17, 1900. [2] Phila. Med. Jour., Apr. 13, 1901.
[3] Lancet, 1900, II, p. 1074.

caused by a Mauser bullet. The femoral artery was tied, and he recovered with full use of limb."

G. R. Fowler [1] reports 2 cases of **excision of a femoral aneurysm.** Case 1 was a man aged 33, who 22 months before had received a stab wound in Scarpa's triangle. The tumor, which proved to be an arteriovenous aneurysm, was exposed and the femoral artery ligated above and below the sac. The limb was in good condition for several months when the aneurysm relapsed. At the second operation a branch of the femoral, springing from the artery between the points previously ligated, fed the sac by blood from the profunda; this branch was ligated, the femoral artery and vein tied above and below the mass, and the aneurysm removed. Three years after operation there were no signs of return. Case 2 occurred in a man 59 years of age, who, 3 years before, had received a violent blow just below Poupart's ligament. The entire sac of the aneurysm was excised. The patient died on the second day from pulmonary edema. [Excision of the sac when possible and in properly selected cases is undoubtedly the most rational treatment and productive of the best results.]

C. A. Hamann [2] presented to the Chicago Medical Society, September 14, 1900, a case of **popliteal aneurysm cured by digital pressure of the femoral artery** for 46 hours.

H. M. Taylor [3] reports a case of **traumatic popliteal aneurysm treated by excision of the sac.** The patient made an uneventful recovery.

Merklen,[4] at the Société Médicale des Hôpitaux de Paris, November 9, 1900, reported 2 cases of death from **pulmonary embolism secondary to phlebitis of the lower extremities.** One followed childbirth and the second was secondary to a hematoma of the leg caused by a crush. In the first case death occurred on the twenty-third day, and in the second case 5 weeks after the onset of the phlebitis. Emboli occurring during the early days of a phlebitis are small, friable, but little adherent, and with rare exceptions benign. The late emboli are often mortal, as they consist of large clots. The author believes these late emboli are due to exacerbations of the phlebitis followed by the formation of new clots not immediately adherent. In the treatment it is necessary to keep the limb absolutely at rest for several weeks after the subsidence of the fever. It is unlikely that an adherent organized clot would become detached. Launois finds that after a variable time the clot becomes organized and obliterates the vein, thus accounting for the persistent edema. Hallopeau reported a case of embolism occurring 6 months after the original phlebitis and terminating in death. Lesne and Ravaut [5] believe that tuberculosis may not only affect the veins secondarily, but may also cause a primary endophlebitis resembling the common inflammation of a vein. They have confirmed these observations on guinea-pigs.

[1] Med. Rec., Mar. 23, 1901.
[2] Jour. Am. Med. Assoc., Oct. 13, 1900.
[3] Va. Med. Semi-Month., Nov. 23, 1900.
[4] Med. News, Dec. 29, 1900.
[5] La Semaine Méd., Oct. 10, 1900.

K. G. Lennander[1] suggests that after abdominal operations the lower end of the patient's bed be raised from 4 to 19 inches to favor the return flow of blood and so prevent **thrombosis in the veins of the lower limbs.** Since January, 1899, this procedure has been adopted and no case of thrombosis of the pelvic or lower extremity veins has developed. During convalescence the end of the bed may be lowered to from 4 to 6 inches, and in many cases this should be maintained even after the patient has returned home. This is especially important in patients suffering with cardiac debility or in those with varices. Cardiac stimulants and subcutaneous or intravenous injections of salt solution should be administered before and after operation in all patients afflicted with cardiac asthenia. With emaciated patients subcutaneous injections of from 17 to 35 ounces of a 5% to 10% solution of grape sugar, as well as injections of olive oil, from 1½ to 7 ounces, may be given in 24 hours. When varices are present, bandaging and gentle friction should be employed.

J. B. Blake[2] reports the result of 11 operations for **varicose veins of the lower extremities.** Seven patients were cured, 3 were partially relieved, and 1 was made worse. Blake submits the following conclusions: "(1) Operation for radical cure of varicose veins by dissection is not successful in every case. (2) To obtain successful results cases must be selected and certain conditions avoided, and recommended to palliative treatment. (3) The conditions which will probably militate fatally against satisfactory results are: (*a*) Old age, or an extremely debilitated condition; (*b*) excessive and very extensive varicosity; (*c*) occupations which to an extraordinary degree favor the development of varicose veins. (4) Cases which may be cured by a thorough and careful operation are: (*a*) Local varix, even of marked prominence, particularly if thrombosis has occurred, either in thigh or lower leg; (*b*) extensive varix, limited to a single venous stem; (*c*) varicosities, which are a bar to passing civil service, military or naval examination; (*d*) cases in youth and middle life; (*e*) cases in which the development of the permanent varicosity was at least partially due to more or less removable conditions (flat-foot, garters, etc.). (5) Operation, even if not entirely successful, will usually relieve such complications as thrombosis, hemorrhage, and ulceration. (6) The usual conditions which follow unsuccessful operations are: (*a*) Pain in and around the scar; (*b*) general swelling and tenderness of the leg; (*c*) development of varicosities above or below the operation scar, but not at the site of the operation itself. (7) In all operated cases, general systemic treatment as well as local treatment should be prescribed, together with exercise and the avoidance of a continuous upright position whenever possible. (8) Cure of symptoms does not necessarily mean the removal of all visible varicosities. (9) Comparison of relative methods of multiple ligation and continuous dissection must be based upon a larger number of cases than are here recorded."

William Thorburn[3] divides **varix of the lower extremity** into

[1] Lancet, Sept. 15, 1900. [2] Boston M. and S. Jour., Dec. 13, 1900.
[3] Brit. Med. Jour., Nov. 17, 1900.

congenital or developmental enlargement due to a weakness of the walls of the vein or its valves, varix due to obstruction, and hyperemic or inflammatory varicosity due to an increased influx of blood. Developmental varix is usually limited to the larger trunks, is often unilateral, and generally confined to young adults. Edema, eczema, and ulceration are rarely present. Obstructive varix is bilateral, veins of all sizes are involved, and it increases in frequency as age advances. Edema, eczema, and ulceration almost always develop. This form of the disease is not caused by obstruction alone, but by the effects of obstruction acting on veins already weakened by inheritance. Hyperemic varix is confined to the venules and appears as infiltrated areas scattered over the surface of a limb. The larger the developmental factor entering into the formation of a varix, the greater the probability of a successful result after excision.

E. A. Mills-Roberts [1] reports a case in which a **varicosity of the internal saphenous vein** was complicated by irritation of the internal saphenous nerve and in which excision of the dilated vein was followed by permanent cure. The condition was unilateral, occurred in a man aged 42, and the pain was so severe that the patient was forced to give up his employment, that of a quarryman.

C. G. Levison [2] reports a case of **thrombosis of the lateral and sigmoid sinuses** following an operation for the removal of a carcinoma of the neck, which necessitated the resection of 2 inches of the internal jugular vein. The postoperative course was normal until the fifth day, when the patient became stupid and slightly delirious; death occurred on the following day. The thrombus was undergoing organization and infection was absent.

DISEASES OF THE LYMPHATIC SYSTEM AND OF THE THYROID GLAND.

J. Collins Warren [3] says the operative treatment of **thyroid tumors** is indicated in rapidly growing tumors in young persons in whom medicinal treatment has been ineffectual and when pressure-symptoms are present. He uses ether-anesthesia, makes a U-shaped incision, retracts the sternomastoid, occasionally divides the sternohyoid, sternothyroid, and omohyoid muscles, suturing them later, and carefully avoids injury to the capsule of the gland. The upper and outer portion of the lobe is freed by clamping and severing the tissue which holds it, and the superior thyroid artery is then secured. Next the mass is pushed toward the median line and the inferior thyroid artery exposed. Here great care should be exercised lest the recurrent laryngeal nerve, which lies in close contact with and directly behind the artery, be included in the ligature. The tumor is now turned over on the opposite side of the neck and its connections severed with a knife. Many cases are reported in which total thyroidectomy has not been

[1] Lancet, Nov. 10, 1900. [2] Med. News, Jan. 19, 1901.
[3] Boston M. and S. Jour., Dec. 27, 1900.

followed by myxedema, accessory glands being present. A portion of the gland, however, should always be allowed to remain. A mass the size of an English walnut is sufficient for this purpose. Fine silk is used as ligature material because it is less likely to slip than catgut. It is well to administer morphin hypodermically and to apply a tin anterior angular elbow splint to the neck to insure immobilization. If vomiting occurs, gentle pressure should be made upon the wound to prevent hemorrhage. A small gauze drain is allowed to remain for 24 hours, to prevent pressure on the trachea by accumulating serum or blood. Enucleation is reserved for small solid adenomas and cysts. Reinbach reports 80 cases of resection of a wedge-shaped piece of the gland (Mikulicz's method) followed by suture of the remaining portion with a mortality of 3.75%. Warren's only death was due to heart-failure, and occurred at the end of an operation for the removal of an enormous goiter. Reverdin collected 6103 cases, with a mortality of 2.88%. Brunner reports 31% of recurrences, 18% being on the side operated upon and 23% on the opposite side. The author has operated on an aberrant goiter situated between the base of the tongue and the epiglottis. Hofmeister reports such a tumor under the skin of the breast. Warren has had no experience with cervical ganglionectomy; Jonnesco reports 10 cases, with 6 cures and 4 improved. Kocher believes 90% are amenable to medicinal treatment and that thyroid extract gives no better results than iodin. Warren has never seen a single case cured by the thyroid treatment. He has operated upon 2 cases of **exophthalmic goiter**; in one case the temperature rose to 106° and the pulse to 202 after operation. The patient recovered, but her health was only partially restored by the operation. The second patient died on the fourth day during a sudden attack of tachycardia.

Lincoln Davis [1] gives the **statistics of the operative treatment of thyroid tumors**:

Simple Goiter.—There has been a rapid decline in the mortality during the last 50 years. In 70 operative cases reported before 1850, Kocher placed the mortality at 40%; in about 400 operations between 1850 and 1883 it fell to less than 15%; and finally, in the period since 1883, in 6000 operative cases, the mortality is under 3%. Kocher in 1895 reported 1000 cases of goiter before the German Congress of Surgery. Of these, 870 were benign, with 11 deaths, a mortality of 1.37%. Some were *in extremis* when operated upon; 5 patients died as the immediate result of the operation, 3 died of Basedow's disease, 2 of infection, and 1 death was due to chloroform. In 1898 he reported 600 additional cases. Of 556 cases of benign goiter which were operated on in this last series, there was but a single fatality, and that due to chloroform; mortality 0.18%, about one-thirtieth of the mortality of his first 100 cases reported in 1883. Since the latter date, his total number of operations for simple goiter is 1426, with 12 deaths, a mortality of 0.84%. Partial extirpation of the gland was performed in the great majority of

[1] Boston M. and S. Jour., Dec. 27, 1900.

cases. At the German Congress in 1896, Bruns reported 400 operations for goiter dating back to 1883, with a mortality of 1.5%. He had no deaths in his last 150 cases. Girard, of Berne, reported in 1898 545 cases, with 6 deaths, a mortality of 1.1%. Socin, of Bâle, stated in 1898 that in his last 200 cases he had 1 death from pneumonia, a mortality of 0.5%. He is an advocate of the method of enucleation. Krönlein in 1892 reported 200 cases without a single death. In this country and in England the disease is comparatively rare, and operations consequently few. Martin collected 182 cases of goiter from the reports of five hospitals in Philadelphia for 10 years down to 1897; only 5 of these cases were operated on, with 1 death. The records of the Massachusetts General Hospital show 37 operations for simple goiter, with 2 deaths. In 3408 operations of which Reverdin found details there were 118 deaths, distributed as follows:

137 total extirpations	26 deaths,	18.98%
1212 partial extirpations	42 "	3.46 "
1276 enucleations	10 "	0.78 "
345 resections	23 "	6.66 "
438 other methods	17 "	3.88 "

The mortality of the 1276 enucleations is practically that of Kocher in his 1426 cases, in the majority of which he performed partial extirpation. In 96 of the 118 fatal cases the causes of death were known. Forty-five were of respiratory origin, divided as follows: Pneumonia, bronchopneumonia, and bronchitis, 32; asphyxia, 10; fatal lesions of recurrent laryngeal nerves, 3. Twelve deaths were due to collapse and shock. There were 19 cases of fatal hemorrhage; none of these followed enucleation. Thirteen deaths were due to sepsis, 3 to tetany, and 1 to myxedema. In the whole literature Reverdin knows of 9 published cases of death due to entrance of air into the veins. Kocher reports 2 deaths from chloroform. He uses cocain anesthesia in the majority of cases. Bergeat states that only 3 out of 249 cases showed absence of fever in convalescence, although the usual course of wound healing was nearly perfect. This phenomenon, called thyroid fever by Berard, is ascribed by him to absorption of the thyroid secretion set free at the time of operation. The committee of the Clinical Society of London collected 277 cases of complete thyroidectomy for simple goiter, in which the patients recovered and were kept under observation. In 69 cases, or 25%, cachexia strumipriva developed. Of more than 550 cases of partial thyroidectomy, in which the patients recovered and were followed up, 6 only showed distinct symptoms of myxedema, a little more than 1%. Reverdin's statistics give a like percentage of cachexia strumipriva in total thyroidectomy, and a percentage of less than 0.5 in partial extirpation. Kocher reports 4 cases of myxedema in 1600 operations for goiters of all kinds, including malignant disease—0.25%. Tetany occurred 5 times in 137 total thyroidectomies, in Reverdin's series—3.64%. Fourteen cases followed all other operations—less than 0.5%. Kocher reports a case of tetany following ligature of the four thyroid arteries. Disturbance of phonation as the result of

injury to the recurrent laryngeal nerves occurred 57 times in 1212 partial extirpations (4.7 %) and 11 times in 1276 enucleations (0.86 %) in Reverdin's collection. Kocher's percentage is 7 in 900 cases. It proved temporary, however, in all the cases of benign goiter. All operations are liable to recurrence, since total thyroidectomy is proscribed. Of 146 cases of simple goiter operated in Czerny's clinic, which were followed from 1 to 11 years after operation, 30, or 20 %, had recurrence. Kopp reexamined 103 cases operated on by Roux, of Lausanne, after an interval of from 1½ to 6 years. He found 36 cases in which the remaining portion of the gland had increased in size, in 19 to a slight extent only. Of these 36 cases, 13 were operated on by Socin's method and 20 by Kocher's. Bruns reports 800 cases of Socin, Krönlein, Kappeler, and his own, out of which less than 1 dozen required secondary operation for recurrence.

Malignant Goiter.—Kocher's mortality in 1883 was 25 %, and it is 33 % in his last report in 1898. Thirty-three cases operated in Czerny's clinic gave a mortality of 15 %. Five cases were free from recurrence up to 4½ years. Sarcoma is rarer and more fatal than carcinoma. Tiffany, in 1897, collected 16 cases of sarcoma which were operated on, all with fatal results. Davis has found 3 more cases in the literature, and 3 in the records of the Massachusetts General Hospital; all fatal.

Exophthalmic Goiter.—Schulz gives the results of 319 operations as follows: Cured, 175 (51 %); improved, 89 (28 %); unimproved, 13 (4 %); died, 41 (13 %). There are three principal operations in use at the present time: (1) Removal of a portion of the thyroid gland; (2) ligature of thyroid arteries; (3) resection of cervical sympathetic nerves. In Schulz's collection there are 177 cases in which a portion of the gland was removed with cure in 102 (57 %); improvement in 47 (26 %); no improvement in 4 (2 %); death in 24 (13 %). One hundred and forty-nine of the cases were followed. The operation, in addition to the dangers attaching to any thyroidectomy, seems to present a special gravity in this disease. A considerable number of sudden deaths, either during or after the operation, have been reported. These deaths are ascribed by many to acute poisoning from absorption of the secretion of the incised gland. Kocher has tied three arteries in 49 cases of exophthalmic goiter, with 5 deaths. In 34 cases, reported in 1895, there was cure or improvement in 31. Rydygier has tied all four arteries in 22 cases. Cure or improvement resulted in 20; no improvement in 2; no cases of myxedema or tetany followed the operation. Kopp reports a case in which only three arteries were tied, followed by tetany and death. In 81 cases treated by this method the mortality is 8.5 %. Of 50 treated by resection of the cervical sympathetic, 11 (22 %) were cured; 29 (58 %) improved; 4 (8 %) unimproved; and 12 % died. In the case reported by Jonnesco not only the 3 cervical ganglia on each side were removed, but also the first thoracic ganglia.

Charles G. Cumston[1] publishes a study of 42 cases of **neoplasms of the thyroid,** 31 of which were operated upon by Kummer and 13

[1] Boston M. and S. Jour., Dec. 27, 1900.

by himself. Excepting in the malignant cases, the principal symptom complained of was dyspnea; hoarseness and dysphagia were less frequent, and palpitation occurred often. In those cases first treated by iodin compounds but slight improvement was noted. Dyspnea was often out of proportion to the size of the goiter; this was explained at the operation by the presence of a retrosternal enlargement. He occasionally employs the angular and frequently the transverse incision of Kocher. In most of the cases the sternomastoid has not been divided, but simply nicked. From a study of the specimens he concludes that total extirpation is the better operation in most of the cases of goiter, as the colloid or cystic degeneration is usually diffuse. He cites a case of recurrence after an enucleation in which the respiratory trouble returned and a total extirpation of one lobe was performed. A few years later the opposite lobe became diseased, but the respiratory symptoms did not return. A second case was subjected to a total excision of one lobe for dyspnea, and this symptom did not return although a recurrence appeared on the other side. In the operations in which the recurrent laryngeal nerve was wounded, the author believes it was injured not during the ligation of the inferior thyroid artery, but at the point on the lateral aspect of the trachea just before it enters the larynx. In the future a bit of the thyroid tissue will be left at this place in order to avoid the nerve. Fine silk is used for ligature material. He mentions a case of **typhoidal strumitis** occurring in a girl 18 or 19 years of age. Operation was performed because of pressure on the trachea. Cultures revealed the presence of the typhoid bacillus. One of the cases in which an extremely small left lobe was left at the time of operation developed cachexia strumipriva. A fistula was present through which a silk ligature was later discharged. When the suppuration ceased, the patient improved and is now in excellent health. In another case tetany ensued after a nearly complete excision of the gland for cancer. One case of sarcoma is recorded in a woman aged 47, the patient dying 2 years after operation of general sarcomatosis. The last case reported was a goiter which became infected during an attack of influenza, a large quantity of pus being evacuated.

James Berry [1] gives a table of **72 goiter operations,** the largest number thus far brought forward by an English surgeon. There were 33 cases of extirpation and 39 of enucleation. He performs enucleation more frequently than formerly, as his powers of diagnosis have become more acute. Many goiters, including all the parenchymatous ones, cannot be treated by enucleation without unjustifiable risk. An examination of the specimens removed shows that in the first 3 cases enucleation might have been performed. In at least 25 of the extirpations enucleation would have been disastrous. Of the patients, 54 were operated upon because of dyspnea, 9 for slight difficulty of breathing and considerable narrowing or displacement of the trachea, 5 for deformity, 3 because of a suspicion of malignant disease, and 1 for prolonged suppuration following an incision into a goiter. Dysphagia has rarely been a prominent

[1] Brit. Med. Jour., July 7, 1900.

symptom. Enucleation may be performed for deformity alone, but extirpation should never be adopted. Extreme dyspnea due to simple goiter should be treated by excision and not by tracheotomy. Malignant growths which show shortness of breath are rarely suited to operation, and tracheotomy is often the only means of relief. There are 2 classes of thyroid tumor which are especially dangerous because of the liability of sudden dyspnea. One is the rapidly growing bilateral parenchymatous variety which occurs in the young, and the other is that in which a unilateral growth becomes suddenly jammed in the upper opening of the thorax. One of Berry's cases is an example of sudden dyspnea due to hemorrhage into a goiter. During a fit of laughter the tumor suddenly swelled and breathing became difficult. Small tumors projecting from the back of the gland are rare and are difficult to diagnosticate; if pressure is made on the trachea, the condition is best revealed by the laryngoscope. A small goiter may cause intense dyspnea either from a posterior projection or from a downward prolongation behind the sternum, which may be on the same side as the prominent lobe of the gland or on the opposite side. A careful examination of the position of the displaced trachea will be of much service in determining which lobe is the cause of the difficulty. If the growth is not causing dyspnea, a general anesthetic may be given, but the occurrence of a death under chloroform has led the author to look upon general anesthesia as a serious question. He is especially careful to watch the breathing when the tumor is lifted from its bed. In 10 of the later operations local anesthesia has been employed. Whenever room is essential, an oblique incision along the anterior border of the sternomastoid is made, and the median cut is reserved for those cases in which it is uncertain which lobe is to be removed. The transverse incision is limited to easy cases of enucleation in which appearance is of great importance. The author has never cut the recurrent laryngeal nerve, but in one case of bilateral extirpation in which the wound healed by granulation the nerve became paralyzed soon after the operation, owing to its incarceration in scar-tissue. Of late a portion of the gland with its capsule has been left near the trachea and the inferior thyroid artery ligated close to the gland in order to insure against involvement of the nerve. The chief difficulty in enucleation is the recognition of the thin layer of gland-tissue that covers the tumor, as the incision should be carried through this layer and no further. Little importance is attached to removal of the growth in an unbroken condition; indeed, it is frequently deliberately opened and the contents allowed to run out, thus permitting a large mass to be removed through a small incision. A finger is then inserted into the sac and the gland-tissue peeled from it with dissecting forceps or a goiter scoop. Rapidity is essential because of hemorrhage. In some cases of large cysts and adenomas all the vessels around the gland were clamped before enucleation was attempted. Of the 72 cases operated upon there were 3 deaths, 1 from chloroform and the other 2 occurred in cases requiring extensive excision. In 56 the wound healed by primary union. Drainage is usually employed for 24 hours. All the patients but 3 which

could not be traced are well at the present time. [Since this paper was completed the author has operated on 20 additional cases; 18 healed by primary union and 2 recovered with a sinus.]

Kocher[1] reported to the Thirtieth Session of the German Surgical Society, April 10, 1901, a **second thousand cases of goiter extirpation.** He emphasizes that he usually performs excision and rarely enucleation. He uses a forceps for compressing the isthmus in order to make it as small as possible before applying the ligature. His mortality is 4%; infection plays no part. He conducts an aseptic operation, only the ligatures being prepared with antiseptics. Thyroid extract is administered before operation in cases of diffuse and long-standing goiter. Operation is performed under local anesthesia in order to avoid the bleeding caused by vomiting. **Struma intrathoracica** or struma profunda may produce emphysema, bronchitis, tachycardia, etc. In speaking of the diagnosis, he mentioned the value of percussion and the use of the x-ray. In retrosternal goiter all the vessels and the isthmus are divided before extraction is attempted; this is aided by a forceps and spoon which he has had constructed. Movable tumors give a more hopeful prognosis than fixed ones. Gauze tamponage is dangerous in this region, as it may cause choking. In the medicinal treatment he prefers the iodin compounds to thyroid extract. Chronic poisoning may be caused by either of these drugs. The younger Kocher has conducted some experiments with iodin phosphate. He found that the amount of iodin contained in the thyroid continually decreases in goiter, and that the amount of phosphorus increases, especially in pregnant women. After the treatment with phosphorus he observed in one case an increase of iodin from 0.018 to 0.4, in another from 0.00862 to 1.2, while the percentage of phosphorus decreased. Attention is called to the fact that in regions where goiter abounds food containing phosphorus is rarely consumed, and that in countries like England, where goiter is seldom seen, milk and eggs are freely eaten. Kraske reports 420 operations performed at the Freiburg Clinic, one-third of which were in males, and two-thirds in females. Extirpation of one lobe was performed 220 times. Among the first cases were some total extirpations, but the rest were enucleations and resections. Nodular goiters were most frequent and pure hypertrophy of the gland was rare; 10 were malignant; 2 accessory growths were removed, 1 from the supraclavicular region and 1 from the tongue. Like Kocher, he operates under local anesthesia. He has had but 2 deaths, 1 from cardiac trouble (probably) due to the use of thyroid extract, and 1 from tetany following extirpation of both lobes. Since abandoning enucleation and general anesthesia he has seen no alarming postoperative hemorrhage. The postoperative rise of temperature is due to absorption of thyroid material set free. Thyroid extract is of little value; the improvement noted in some cases is due, not to its effect on the pathologic tissue, but to the atrophy of the normal gland-tissue. The treatment is theoretically wrong and may make operation more difficult by the production of connective tissue

[1] Phila. Med. Jour., May 4, 1901.

the result of atrophy of the gland. Goldman reported a case of tuberculous intrathoracic struma. Riedel has operated on 500 cases. He directs attention to the possibility of a left retrosternal growth with an ordinary tumor on the right side. He believes the special instrument devised by Kocher to be unnecessary, and advises a curved incision extending from the suprasternal notch to the ears to obtain sufficient room. He also operates under local anesthesia. Retere reported an inoperable case cured by the iodid treatment. In response to a question, Kocher stated that one-fourth of the gland was sufficient to leave after operation.

Genevet [1] presented to the Société des Sciences des Médicale de Lyon a case of **exothyropexy in an infant 1 week old.** At birth the child was resuscitated from impending asphyxia due to a small growth in the lower neck. The diagnosis lay between thymus gland, hemorrhage into a thyroid cyst, and a goiter. An incision was made, and the tumor, which proved to be a goiter, fastened outside the wound. The mother had goiter and had previously lost a child with symptoms similar to the case reported.

W. B. Thistle [2] reports 2 cases of **exophthalmic goiter treated by operation.** The first patient was a man aged 24, who had previously recovered from an attack of Graves' disease. During the present exacerbation he showed every symptom of the disease and had lost 40 pounds in weight. Rest, potassium iodid, and belladonna proved of little use. A tumor, together with a portion of the gland, was removed, and complete recovery followed. The second case, a woman, aged 34 years, was a typical subject. The gland was tapped, a dark brown liquid drawn off, and a solution of iron perchlorid injected. Recovery was complete.

M. F. Coomes [3] operated on a case of **exophthalmic goiter by removing the right cervical sympathetic ganglion.** The disease, which had existed 2 years, occurred in a colored woman, aged 29, and resisted all medicinal treatment. Much improvement followed the operation; the eyes receded, the pulse became slower, the nervousness almost entirely disappeared, and the patient increased in weight. [The value of this procedure is very questionable, and it must as yet be looked upon as a surgical experiment.]

Walter Edmunds [4] says the thyroid system consists of 2 lateral lobes and 4 small glands, called the parathyroids, which lie on or near the thyroid, 2 on each side. In dogs, excision of this system is followed by convulsive attacks, paralysis, and death within a few days. Excision of the parathyroids usually causes the same end. Excision of the thyroid alone is followed by no ill results. Monkeys react in the same way, except that the symptoms are not so acute. In both monkeys and rabbits, if the animal survive long enough, swelling about the face, alopecia, and paresis of the limbs develop. In man, **excision of the thyroid** is followed by symptoms which are chronic in character; but

[1] Lyon Méd., Oct. 29, 1899.
[2] Canad. Pract. and Rev., Feb., 1901.
[3] Am. Pract. and News, Aug. 15, 1900.
[4] Practitioner, Apr., 1901.

these may come on acutely. From a girl aged 16 both lobes of the thyroid were excised at 3½ months' interval. Death occurred 21 days after the second operation, with symptoms resembling those observed in dogs. He says the lateral lobes generally atrophy after division of the isthmus; and the remaining lobe undergoes the same process after unilateral resection of the thyroid. The deaths occurring suddenly after thyroid operations are generally attributed to the resorption of thyroid secretion from the cut gland. The author thinks the resemblance of these cases to those of experimental athyroidea suggests the possibility of their being due to the loss of the glandular secretion.

J. H. Nattrass[1] reports a **hydatid of the thyroid gland** in a boy 8½ years of age. A swelling had existed in the right side of the neck for 4 months; it gave no pain or inconvenience of any kind. It was lobulated, about the size of a pigeon egg, well defined, and movable. The capsule was opened and the endocyst evacuated. The diagnosis was corroborated by the microscope.

Prescott Le Breton,[2] in a paper on the **operative treatment of tuberculous lymphomas of the neck,** says no surgeon would think of removing such able sentinels as the lymphatic glands so long as they preserve their usefulness; but when infection overcomes the resistance they offer operation is demanded. Schleich advises a conservatism almost unsurgical because of the unsatisfactory data as to surgical treatment. Wheaton states the removal of such a help to health is often a crime. Horace Grant[3] thinks that, although there is a loss of protection for a time, the remaining glands and newly-formed lymphatic channels soon perform an extra duty, just as one kidney will do the work of two, or as one part of the brain will do the work of a part previously excised. The difficulties of complete removal in competent hands are never insurmountable. Dissemination of tubercle bacilli may be prevented by careful dissection and cleanliness during the operation. General infection occurs in a large proportion of the cases. Van Noorden found that of 149 cases the history of which has been traced for 3 or more years, 28 died of general tuberculosis and 14 were living with pulmonary tuberculosis. The general trend of opinion is toward radical operation in all cases that have withstood medicinal treatment. Watson Cheyne, in the Harveian lectures delivered in 1899, gives the following indications for treatment: (1) Cases in which the glands remain hard, small, and movable, with no marked tendency to softening or matting together, may be left alone and medicinal treatment alone instituted. (2) Cases in which the glands enlarge steadily or at intervals until the whole side of the neck is involved in a mass of glands, some free and others matted together, and in all stages of disease, from those which are fleshy in appearance to those which are cheesy and suppurating, should be submitted to prompt and thorough excision. (3) Cases in which the inflammation is very active require operation. The glands enlarge rapidly and soon suppurate, while fresh

[1] Intercolonial Med. Jour. of Australasia, Sept. 20, 1900.
[2] Phila. Med. Jour., Mar. 9, 1901. [3] N. Y. Med. Jour., Oct. 20, 1900.

glands become involved. Periadenitis is early, and unless the case is operated upon, abscess after abscess forms, and numerous ulcers remain. Although many surgeons are content with scraping, excision is the better plan, with removal of capsules, fat, and neighboring glands. (4) Cases in which there are unopened abscesses may be subdivided according to the position of the abscess. If only 1 or 2 glands enlarge and suppurate, by making an oval incision over the mass and dissecting outside the abscess one may often enucleate abscess and glands *in toto*. If the abscess is accidentally opened while dissecting, the pus should be washed away immediately. Where the abscess has broken through the deep fascia and undermined the skin, it is sometimes wise to incise and drain 3 to 4 weeks and then operate, rather than immediately excise the thin skin over the abscess and leave a large scar that may stretch. (5) Long-standing cases in which ulcers and sinuses remain with remnants of broken-down tubercular tissue and glands at the bottom should be subjected to either excision or scraping, together with the application of iodoform or carbolic acid. It is important to excise the glandular capsules and environing tissue in order to remove many small glands already infected. Hartley believes we should dissect the important structures of the neck from the mass rather than dissect the mass from them. Milton has seen 2 cases in which torticollis followed division of the sternomastoid in these operations, but no other ill effects have been recorded. If the internal jugular vein is adherent to the mass, it should be resected with the glands. The lowest branch of the facial nerve which runs below and parallel to the lower jaw is often severed, causing a transient drooping of the angle of the mouth. Anesthesia of the skin usually results from extensive operations, the superficial cervical nerves being injured. The writer has seen one case in which the thoracic duct was cut. Chyle flowed freely for about a week, then the discharge gradually ceased, pressure being applied over the discharging area. The frequent use of hot saline solution in the wound clears it of blood and causes the tissue to stand out in bold relief. One case is mentioned in which the common carotid sloughed at a point where it was infiltrated with tubercular tissue the night following operation. The hemorrhage was severe, but a ligature was tied about the artery and the patient lived. In the case of a little girl from whose neck the submaxillary glands were excised, death followed on the third day from what was apparently an ulcerative endocarditis. No autopsy could be obtained. Dowd gives the following table of cases whose after-histories were followed in most instances for several years :

Total number of cases	309	
Apparently cured	202	65.4%
Living with local or general tuberculosis	57	18.4 "
Died of tuberculosis	50	16.2 "

Since it has been proved that the bacilli enter, as a rule, through the mouth and pharynx, an important adjunct to the treatment is the removal of adenoids and hypertrophied tonsils and the care of carious teeth. Eczema of the scalp, rhinitis, and otitis also demand attention.

Lathrop and Pratt[1] report 2 cases of **filariasis.** The rarity of this disease in northern climes makes its recognition difficult. The first patient was supposed to have a small hernia with a varicocele. At operation 10 thick-walled, tortuous vessels, lighter in color than veins, were removed. Two weeks later the scrotum became distended and was aspirated, the fluid containing the filarias. Later the sac, together with the testicle, was resected. The sac was smooth, thickened, and opaque; the cord was thickened, measuring 5 centimeters at the lower end; the globus major was much enlarged, softened, and covered with enlarged varicose lymphatics, and the testicle was increased in size and contained both male and female filarias. Lymph scrotum was absent. The wounds healed primarily, but when last seen, 5 months after operation, filarias were still present in the blood. The patient had resided in Barbadoes before coming to Boston. His brother, although presenting no symptoms, had numerous embryos in his blood. The authors give an exhaustive review of the literature. In 11 cases only have the adult filarias of Bancroft been found, the reported case being the first in this country. Many individuals have the embryos in their blood, but give no external evidence of their presence. The parent worms probably live a long while, but usually remain in lymphatic vessels inaccessible to the surgeon. Operation is called for in local lymphatic obstruction which is due to the adult worm or its ova. Dilated varicose lymph-glands are treated by excision; they decrease in size when the patient is lying down, and are filled with fluid which may be aspirated. Varicose lymph-vessels are met in various localities; they should be treated by complete removal. Chyluria, a common sign of filariasis, due to the rupture of distended lymph-vessels into the kidney or bladder, is inoperable. Chylous hydrocele demands extirpation of the testicle, as the parent worm here resides. Lymph scrotum, if giving trouble from its size, should be amputated, the testes being covered by flaps from the abdomen or thigh. Elephantiasis involving the leg is occasionally benefited by resection of strips of skin, but amputation is frequently necessary. Filariasis is not directly transmitted from one person to another; it has been demonstrated that the mosquito acts as the intermediary host and that the young filarias exist in water. The fact that the disease is being found with greater frequency should lead us to adopt preventive measures. Thorough local measures have given such great benefit that the advisability of an exploratory laparotomy with the view of finding the glandular domicile of the adult worm and excising it is suggested. [Gibbon resected a number of tortuous and distended lymphatics in both spermatic cords in a case at the Pennsylvania Hospital. The patient was sent to the hospital as a case of varicocele. The filarias were found in abundance in the blood. There was no lymph scrotum and no chyluria. The patient eloped before a complete study of his case could be made.]

[1] Am. Jour. Med. Sci., Nov., 1900.

DISEASES AND FRACTURES OF BONES.

Hübscher[1] calls attention to **expanded metal as a new splint material.** It may be made of any metal like aluminum and may be cut with shears, and is open and lattice-formed. It is easily shaped to the injured part and rigid when bandaged in place.

C. H. Golding-Bird[2] makes some remarks on **skiagraphy and fractures,** especially in their medicolegal relation. Of the x-ray he says we are dealing with an agent of which we know little, and over the chemic, nutritive, and penetrative properties of which we have practically no control. It is useful in cases in which the existence of a fracture is doubtful, and when the surgeon wishes to determine its exact location or direction. Fractures of the fibula, hip, vertical and transverse fractures anywhere may prove most difficult of diagnosis. When there is a possibility of fracture which cannot with certainty be diagnosed, the surgeon should, in self-defense, advise an x-ray examination. He regards the x-ray as a subsidiary agent to diagnosis, and even then its evidence in cases of doubt should be received with caution and only after due interpretation by some one whose experience warrants his speaking with authority. In the bulk of indirect fractures reduced and treated in the best possible manner skiagraphs show an apparent maladaptation of the bone, which by itself would indicate a hopeless failure on the part of the surgeon, and yet the result is that the patient gets well with a good and useful limb. To satisfy the esthetic requirements of skiagraphy, almost every case must be operated upon and the bones fixed by some mechanical means. We must decide whether to advise operation, which carries with it certain risks, in order to obtain a good-looking bone scar at the expense of an ugly one in the skin, or whether we will be content with a good functional result without operation, but one which will not bear the test of the x-rays as an example of cabinetwork. In answer to the question, can a skiagram show a fracture where none exists, he says: "(1) Epiphyseal lines, for example, lower end of ulna, have been mistaken for fractures. (2) Impacted fracture of the neck of the thigh can be imitated by taking a foreshortened view. (3) Fracture through the base of the olecranon is simulated always where the light is directly over the bend of the elbow, the plate being posterior. The band of light is due to the rays penetrating the joint; a lateral skiagraph destroys the illusion. (4) The acromioclavicular joint resembles a fracture. In one case, a clavicle being skiagraphed to show a genuine fracture, this joint was mistaken for a second fracture by the medical attendant. (5) To imitate fracture by sudden break in the bone outline is hardly possible in practice, but the appearance of a gradual thickening of bone can be produced at will. One observer records this thickening to have looked like a Colles' fracture; but the other visible signs could not have been present." Very rarely we may fail to distinguish a fracture. A fracture is usually recognized by irregularity of

[1] Centralbl. f. Chir., Mar. 3, 1900. [2] Brit. Med. Jour., June 8, 1901.

the bone outline. If this be masked, attention should be given to the outline of the medullary cavity. When the fracture involves spongy bone, the altered density along the line of fracture and the irregularities of the cancellous tissues determine it. Sometimes more than one picture may have to be taken. In the ribs, especially the lower ones, because of the shadows of the viscera and of constant motion, and in the spine between the fourth and twelfth dorsal vertebras, because of the mediastinal structures, a fracture may be overlooked. The epiphyseal lines may be mistaken for fracture lines. Of all parts the hip has been the most difficult to define, but by improved methods and skilled hands it is now easy to see. Although fractures of the vault of the cranium and face can be seen, the base of the skull is hardly likely to receive any aid from skiagraphy. When bones are deep and much blood is extravasated, the image may be too indistinct to allow of a certain opinion in a case of doubtful fracture. A united fracture may be seen as one still separated, as early callus does not show. It is easy to understand what interpretation the patient would put on such an appearance. Distortion may be produced by foreshortening, also from the fact that the x-rays are divergent, perspective distortion occurring as the distance increases. Thus, in skiagraphing a foot over the base of the first metatarsal bone, a curved distortion of the ends of the outer toes is often seen. It may also be that the same explanation accounts for the line of fracture appearing so ill-adapted while clinically everything seems normal and satisfactory. An appearance of gradual expansion of a bone may be easily produced by a want of parallelism between the plate and the limb. The patient should be told that the "new photography" is not part of the cure; that the setting of a fracture is not a piece of cabinet-work, but that it is impossible to accurately approximate bones buried in soft parts without operation, although the apparent displacement of the fragments does not indicate lack of union nor loss of function. He considers skiagraphy a less reliable witness than ordinary photography. In charges of malpractice it is not the beauty of the bone-scar that should determine the rights of the case, but the relationship that the skiagraphic appearances bear to the clinical result produced by the treatment. The latter, neither lawyer nor photographer, but a professional witness only, can estimate. He compares it to a sharp-edged tool, which, injudiciously handled, may inflict a life-long injury.

Wolff[1] says that **traumatic diastases** may be diagnosed with certainty from fractures by means of the x-ray. This injury is found in patients under 18 years of age. In 525 fractures, of which 121 were in persons under 18 years old, 34 diastases were seen, the relative frequency being as 1 to 4. The epiphyses around the elbow-joint are the ones generally separated, the injury being, as a rule, direct violence. If ossification be but little advanced, a skiagram may be very indefinite.

Wm. H. Bennett[2] **writes on the present treatment of simple fractures,** basing his remarks on the practices of a number of surgeons to whom he sent a series of questions. He adopts the following con-

[1] Centralbl. f. Chir., 1900, No. 13. [2] Brit. Med. Jour., Oct. 6, 1900.

clusions: "(1) The treatment of simple fractures at present, although less stereotyped than hitherto, is still conducted generally too much upon lines which are traditional rather than rational. (2) The use of splints for long periods is disadvantageous, especially in the form of irremovable appliances such as plaster-of-paris and the like. (3) Speaking generally, the earlier movements of the joints above and below the fracture in a long bone are used, the shorter is the time occupied in recovery. (4) The legitimate scope of the operative treatment of simple fracture is limited and should be confined to (*a*) cases which are otherwise unmanageable, (*b*) special cases, such, for example, as certain spiral and oblique fractures, mainly of the tibia, and (*c*) certain fractures near joints in adults, notably of the humerus at the elbow. (5) The operative treatment of recent fracture of the patella is by no means so generally satisfactory or so free from risk as published cases would tend to show; and further, in cases in which the separation of the fragments does not exceed half or even three-fourths of an inch, as good results for practical purposes are usually obtainable without operation, although less rapidly. (6) The use of massage and passive movements immediately in simple fracture when the circumstances of the patient and of the practitioner admit of it, either in its entirety or with modifications, is, in the majority of cases, the best means of effecting a rapid and useful recovery. (7) The tendency of late has been to exaggerate the degree of disability and diminution in wage-earning capacity following upon simple fractures. (8) Although no pains should be spared in obtaining perfect apposition of the fracture ends, moderate displacement, provided that it is not rotatory, is not necessarily followed by any disability if care be taken by the use of early movements to prevent any matting of the parts around the fracture; in other words, the disability which follows in certain cases in which the position of the united fragments is not ideal, is due, not to the bony deformity, but to the adhesion of the soft parts around, which is easily preventable. (9) Having regard to the unavoidable modifications which must be dictated by the circumstances, social and otherwise, of the patient, and by the facilities possessed by the practitioner, no one method of treatment for simple fractures can be insisted upon for routine use even in cases in which the local conditions are precisely alike."

In a letter to the "Lancet," December 8, 1900, Noble Smith advocates the application of **adhesive plaster** in the treatment of sprains. He says no attempt should be made to produce pressure, but the plaster should be laid on only with sufficient firmness to allow it to adhere without creases. If the deep tissues are not severely injured, it is well to precede the application by several minutes of gentle massage. As the swelling of the joint subsides, the plaster should be removed and a new series of straps applied, and this may be necessary every day. [We have had the very best results in the treatment of sprains of the ankle from the use of the adhesive strip dressing of Gibney. The good results, however, we believe to be due to the even and firm pressure exerted by the strapping.]

A. H. Tubby [1] says that after a **sprain** there are two stages, indicated by two well-defined attacks of pain. The first is due to the stretching and tearing of the parts and the effusion of blood. A period of quiescence, lasting 2 or 3 hours, then ensues; this is followed by pain due to tension and continued effusion of blood. In the knee there is a spot just below and on the inner side of the patella, which is very tender; at the ankle a similar spot exists in front of the external malleolus. Their presence is due to ruptured ligaments and later to the persistence of an inflammation of the synovial fringes. It is during the hours of quiescence that the application of cold is so effective, contracting the vessels and so limiting effusion. If the amount of effusion is small, recovery is hastened and stiffness decreased. It is therefore rational to apply cold during the first 3 or 4 hours after the accident. To further check effusion, pressure may be applied, and this must be done so as to bear evenly on all parts of the capsule. This is done by first applying 3 or 4 layers of cotton wool around the joint with a little additional amount at the site of incurvations, before the bandage is applied. When a second attack of pain ensues, hot application should be applied to relieve pain and promote absorption. Tubby believes sprained joints are as a rule kept at rest too long, and that 3 or 4 days after the swelling has subsided movement should be commenced, unless the patient has a tuberculous or gouty history. When the swelling is considerable, massage should be employed. If, after 10 days, the thickening about the joint is still present and the tender spots still remain, counterirritation by blisters is called for. A patient with a severe sprain should be able to go about within 2 or 3 weeks. If pain still persists, a plaster-of-paris cast should be applied and the joint kept at rest from 4 to 6 weeks. Concerning **fractures of the elbow-joint,** he strongly advocates the method of Jones. In the treatment of **separation of the lower epiphysis of the femur** he says reduction may sometimes be accomplished by division of the tendo-Achillis and forcible extension, but displacement is extremely liable to recur. To prevent this, J. Hutchinson, Jr., and H. L. Barnard recommend that the limb should be put up with the heel touching the buttock. In some cases he has been compelled to open the joint and fix the epiphysis with a steel, nickel-plated screw, and in doubtful cases this is the best course to pursue.

G. Wolsey [2] says that **massage in fractures,** especially periarticular ones, shortens the time of repair by one-third and of functional use by one-half, subsequent stiffness and atrophy being avoided. Retentive dressings should be applied between the seances in order to quiet the fears of the patient regarding displacement. Massage may be begun about the third day. In fractures of the patella there is no treatment which yields better results as to union and function than massage combined with elastic compression at first, and passive motion later. As contraindications to the use of massage may be mentioned compound fractures, fractures with large blebs, projecting fragments, great mobility, and a proneness of the deformity to recur. Massage and passive motion alle-

[1] Lancet, Nov. 17, 1900.

[2] Ann. of Surg., Sept., 1900.

viate pain, reduce swelling, quicken callus-formation, prevent atrophy, and preclude stiffness of joints and tendons. When it is not possible to keep the fragments in place during massage, a plaster splint should be worn for from 8 to 14 days and massage then begun.

Fred. J. Cotton [1] details 10 cases of **subperiosteal fractures.** The usual type of greenstick fracture is subperiosteal, but beyond this the correspondence between the two types is not close. There is no deformity, but a clean-cut crack or cross-fracture, and no bent or half-broken layer of bone to prevent the readjustment of the surfaces. The absence of crepitus and mobility is dependent upon the thick, intact periosteal layer. The cases reported show no fixed type in the direction or character of the fracture, but they do show that fractures of various sorts may show an apparent immobility, due not so much to intact bone as to intact periosteum.

Herbert W. Allingham [2] reports 3 cases of **fracture-dislocation of the spine treated by laminectomy.** In the first patient the fifth cervical vertebra was dislocated forward and its laminas were pressing on the cord posteriorly. The patient was operated on 18 days after injury by removing the displaced laminas. He died from intractable diarrhea 15 days after operation, although there were already marked signs of improvement in the paralysis and anesthesia. The second patient sustained a fracture at about the eleventh dorsal vertebra. Two days later laminectomy was performed and a large subdural clot removed. The symptoms in this case were irregular and some improvement had occurred before operation. Complete recovery ensued within 2 months. The last case presented a dislocated fifth cervical vertebra. The laminas and spines of this and the sixth vertebra were cut away. The patient died the same day.

In the "Medical Record," February 23, 1901, is an editorial on **fractures of the spine.** Five cases occurring in the Boston City Hospital are mentioned; in 2 of these operation was performed. Four of the cases presented fractures and displacements of 1 or more of the lower cervical vertebras, and 1 the same variety of injury in the upper dorsal region. The autopsies showed that in cases of this kind, as all observers have noted, there is always considerable displacement of fragments, which is the determining factor in the amount of crushing sustained by the cord. Of the 2 cases operated upon, 1 died 20, and the other 25, hours after the operation; both had fractures in the cervical region. The writer says these cases show that in the presence of certain evidences of injury to the cord there is practically nothing to be gained by operating. It seems to be a fact that the spinal cord is more sensitive to a bruising force than has recently been supposed, and that when the substance of the cord is actually contused and infiltrated with minute extravasations of blood over one or more segments, there is no hope of a real restoration of function. Attention is called to the fact that the patellar reflex may persist with a hopeless degree of crushing of the cord, so that this offers no important favorable prognostic sign. The structure of the spinal cord is

[1] Boston M. and S. Jour., Nov. 29, 1900. [2] Lancet, May 18, 1901.

said to be so delicate that even a transient severe interference with its internal circulation, not mentioning actual laceration of tissue, involves the practical certainty of irreparable damage. The least unfavorable condition which we may expect after an injury with paraplegia is hemorrhage outside the cord. This unusual condition is not likely to occur if there be a fracture, and without fracture operative treatment would be recommended with considerable hesitation. The author affirms that if complete paralysis and anesthesia occur in the region innervated by the cord below the injury, and if these symptoms do not vary, the cord is hopelessly injured and operation useless. It is only in a few uncommon instances that operation may be advised with any hope of doing good. The author says that some patients improve without operation and that in operative cases we should not be in too great haste to attribute slight improvement to the treatment. "The present status of these cases of spinal injury seems to be expressed by saying that nothing can be done for those patients who have the symptoms of crush of the cord at any level, while in other patients the advisability of operating must depend on the apparent requirements of the individual case, with the chances of doing much good at best but dubious. With our present instruments and technic the actual performance of the operation presents no particular difficulties. Much can be done for a patient who shows any inclination toward improvement after laminectomy, by nursing, massage, and some form of electrotherapeusis."

S. P. Kramer [1] reports a case of **fracture and dislocation of the spine** and a case of **gunshot wound of the spine.** The first patient had complete paraplegia with absence of patellar, plantar, and cremasteric reflexes on both sides, following a fall of 20 feet. Laminectomy was performed 77 hours after the injury. The arch of the twelfth dorsal vertebra pressed on the cord. There had evidently been a dislocation of the twelfth dorsal vertebra forward, with perhaps a fracture of the first lumbar, so that the cord was pressed between the body of the first lumbar and the twelfth dorsal vertebras. He gradually improved and is now able to get about with the help of two canes. In the second case a revolver ball had passed from the front of the body through the stomach and lodged in the spinal canal outside the dura, partially embedding itself in the body of the ninth dorsal vertebra. Septicemia and emaciation developed. About 5 months after the injury laminectomy was performed and the bullet removed. On each side of the bullet was a spicule of bone projecting into the canal, which were removed with the bullet. The patient improved somewhat for a time, but succumbed to sepsis about 4 months after operation. Neither motion nor sensation returned.

Francis T. Stewart [2] reported to the Philadelphia Academy of Surgery, April 2, 1900, a case of **incomplete fracture of the fifth and sixth ribs** complicated by **pneumothorax.** The patient was a boy, aged 6 years, who had been struck by a wheel of a coal-cart. The fracture could neither be demonstrated by palpation nor by the x-ray. At

[1] Jour. Am. Med. Assoc., Aug. 11, 1900. [2] Ann. of Surg., Jan., 1901.

the end of 24 hours the whole left chest was distended with air, the cardiac apex being displaced to the fifth right interspace. On the fifth day 4 quarts of air was aspirated. The pneumothorax recurred, and aspiration was again performed on the thirty-first day. Later, signs of sepsis developed and a tube was introduced into the chest. The boy recovered and subsequently died of croupous pneumonia of the opposite side. At autopsy the fifth and sixth ribs were found firmly glued together by callus and were identical in appearance. In each the internal bony cortex had given way in the postaxillary line. A picture of the fifth rib is here given. The rarity of partial fractures of the ribs is questioned. Rib fracture is uncommon in children owing to the great elasticity of the thoracic cage; but when it does occur, the conditions are ideal for an incomplete fracture. It is almost impossible to make a certain diagnosis even with the aid of the x-ray. In 175 cases of fracture of the rib this is the only case in which pneumothorax developed.

Fig. 36.—Incomplete fracture of rib (Stewart, in Ann. of Surg., Jan., 1901).

L. A. Stimson [1] writes on **gunstock deformity following fracture of the humerus.** Gunstock deformity consists in marked permanent adduction of the forearm, which is most apparent when the elbow is in full extension. The marked clinical feature is an abrupt movement of the forearm toward the ulnar side as the limb approaches full extension. Flexion, rotation, and extension are usually normal. The olecranon is prominent and slightly displaced toward the inner side. The inner side of the elbow is flattened and the external condyle is apparently enlarged below and behind. The cause of this deformity is not ascent of the internal nor descent of the external condyle, but an angular displacement of the entire lower end of the bone after a supracondyloid fracture or separation of the epiphysis. Correction of the displacement could probably be easily made by pressure upward and outward against the olecranon in rectangular flexion of the joint, or abduction of the fully extended forearm, and maintenance of the latter position for a week or two will probably be the surest means of preventing recurrence; but it should be combined with confinement to bed. Full flexion of the joint could not be trusted to correct the displacement. Pressure upward against the olecranon by a supporting sling should be carefully avoided, as such pressure would be transmitted to the inner half of the fragment and tend to produce the deformity. The sling should take the weight of the limb at the wrist.

C. B. Lyman [2] reports 3 cases of **fracture of the humerus near the surgical neck with dislocation of its head.** Including these 3 cases

[1] Ann. of Surg., Sept., 1900. [2] Ann. of Surg., Oct., 1900.

there are now 122 cases on record. The form of dislocation usually found is the subcoracoid variety. Of the 122 cases, the fracture was at the surgical neck in 73, at the anatomic neck in 28; in 11 cases it was said that the fracture "occurred at the neck"; in 6, both anatomic and surgical necks were broken; and in 3 it is stated the fracture was in the upper part of the humerus. The upper end of the lower fragment usually lies external to the upper fragment. It is said the fracture commonly takes place through continued abduction combined with forced rotation, the edge of the genoid cavity or the acromion process acting as a fulcrum. In the author's cases the injury resulted from direct violence. In some of the cases the fracture was treated and the dislocation ignored, with the idea of reducing the dislocation after union of the fracture. None of these cases was successful. In others an effort was made to prevent union and thus establish a false joint at the seat of fracture, with only partially successful results. Resection of the upper fragment has not been satisfactory. In 6 of the cases the head was reduced through an open incision, and in all these cases it was necessary to remove the fragment either at the time or subsequently. Lyman advocates the procedure advised by McBurney. This consists in exposing the fracture and inserting a specially constructed hook into a previously drilled hole in the upper fragment. The head is then reduced by traction at right angles to the body. The fracture is then adjusted and the wound dressed.

W. W. Grant [1] reports several cases of **fracture of the elbow-joint.** He says that maintenance of perfect coaptation is almost impossible without fixing the fragments by wire, screw, or clamp. Unlike most fractures, a perfect apposition seems necessary to a perfect functional result. Except in the case of laborers, the evil of the gunstock deformity as regards impairment of the carrying function is much exaggerated. As the action of the triceps and brachialis influences the position of the lower fragment, and as no position will relax both, tenotomy is sometimes useful. In discussing the x-rays the author mentions the great misconception which may arise from skiagraphs taken in different positions and by different operators. He believes it is a mistake to give the x-rays the prominence which some have given them as a diagnostic and prognostic measure.

A. R. Shands [2] is convinced that the **open method of treating supracondyloid fractures of the humerus** would give fewer stiff and deformed elbows than the closed treatment. He prefers to drill a hole through the fragments and then to suture them together with kangaroo-tendon. Three cases are reported.

B. N. Tory [3] reports a **compound fracture of olecranon with dislocation of both bones of forearm.** The olecranon was screwed together and a fair functional result obtained.

E. A. Codman [4] contributes to the study of **fractures of the lower end of the radius.** He studied 140 x-ray plates of this injury.

[1] Jour. Am. Med. Assoc., Mar. 23, 1901.
[2] N. Y. Med. Jour., Dec. 22, 1900.
[3] Jour. Am. Med. Assoc., May 25, 1901.
[4] Boston M. and S. Jour., Sept. 27, 1900.

These he separates into 10 distinct types, according to the lines of cleavage and to the direction of the displacement: Class 1, fracture through the base of the styloid process of the radius; Class 2, fracture of the inner angle of the lower end of the radius; Class 3, transverse fracture at or a little above the epiphyseal line (in adults) without displacement; Class 4, the distal fragment comminuted, either as a simple T-fracture or into several smaller pieces; Class 5, separation of the epiphysis of the lower end of the radius; Class 6, separation of the epiphysis of the lower end of the radius with a chip off the posterior surface of the diaphysis; Class 7, impaction of lower fragment into the shaft; Class 8, typical Colles' fracture, which may itself be divided into two forms—that with marked radial displacement of the fragment, and that in which

Fig. 37.—Fissure of radial head 40 hours after the injury (Beck, in Ann. of Surg., Apr., 1901).

the posterior deformity is more decided; Class 9, stellate fracture of the lower end of the radius, with longitudinal fissures extending into the shaft; Class 10, reversed Colles' fracture—that is, anterior displacement of the lower fragment.

Carl Beck [1] reports a case of **fissure of the head of the radius** caused by direct injury. The elbow was swollen and painful, but no signs of fracture detected. Later ecchymosis appeared above the head of the radius. Diagnosis was made by the skiagraph.

Frederick J. Cotton [2] writes an elaborate paper on the **pathology of fracture of the lower extremity of the radius,** based on the study of museum specimens, descriptions and plates of specimens, autopsy reports, and experiments on the cadaver. He says there is no single

[1] Ann. of Surg., Apr., 1901. [2] Ann. of Surg., Aug. and Sept., 1900.

form of lesion described from an actual specimen and which is susceptible of demonstration in the shadow picture that has not been so demonstrated in one or more clinical cases, nor has the x-ray discovered any previously undescribed lesion. The majority of the cases showed some obliquity upward and backward at the line of cleavage, but in most cases this is very slight. Obliquity in the contrary direction is an extreme rarity. From side to side the fracture line is usually nearly or quite transverse, but a moderate trend upward and outward is by no means unusual. Fractures running obliquely upward and outward are not rare, while the converse obliquity is decidedly uncommon. Separation of the radial styloid alone is not common. The usual height for the fracture is from ¾ to 1 inch above the joint. Comminution is frequent. Displacement backward almost always occurs, and displacement outward is frequent. Displacement forward is rare, as is displacement inward. Entire absence of displacement is by no means uncommon. Rotation backward is well-nigh universal. Rotation outward is the rule, though often slight. Impaction cannot be determined by the skiagraph, but some shortening is common. A broadening between the radius and ulna, indicating ligamentous rupture, is present in a considerable number of cases. Broadening of the wrist as a whole from this cause, from comminution of the radius, or from tilting of the lower fragment up and out is often present to some extent. Concerning the ulna, it is usually dislocated forward, and fracture of its styloid is common. The average of all x-rays shows this lesion in about 50% of the cases. Separation of the radial epiphysis seems to be rather common, and fractures near the intact epiphyseal line are not unusual, especially in small children. The writer concludes from his experimental work that the mechanism of these fractures is neither simple nor constant. It seems probable that the prime factor is the crushing force taking effect at the weakest portion of the bone. Comminution is the result of a splitting of the lower fragment by the upper. Fractures of the radial styloid and fractures obliquely up and outward are produced by marked abduction of the hand at the moment of impact. This may also explain rupture of the radio-ulnar ligaments and triangular fibrocartilage. Fracture of the ulnar styloid is the result of a pull on the lateral ligament. Some cases, however, result from contact of the ulnar styloid with the ground. The writer says it is as simple to describe the lesions as to try to classify them in groups on the basis of such knowledge as we now possess.

G. G. Ross and M. I. Wilbert[1] report a study of 52 cases of **fracture of the carpus.** They believe a number of sprains are really fractures of the carpal bone. Deformity is usually absent unless there be much impaction or rupture of the annular ligament, when the wrist may be decidedly broadened. They emphasize the importance of taking an x-ray picture of both wrists under precisely the same conditions in order to obtain positive information. Fracture of the scaphoid occurred in 18 of 32 cases. But 9 of the 52 cases gave a history of direct violence

[1] Phila. Med. Jour., Oct. 13, 1900.

to the carpus. This is contrary to the statement that fracture of the carpus is caused by direct violence.

Carl Beck [1] advocates the use of rubber drainage tubes pressed into the adjoining interosseous spaces for the treatment of **metacarpal fracture** with lateral deformity. They are kept in place by adhesive plaster and the whole surrounded by a moss splint, a material which, after being dipped in cold water, adapts itself to the contour of the hand. [We have used Beck's method with great satisfaction.]

T. M. Paul [2] analyzes 54 cases of **fracture of the pelvis.** He calls attention to the fact that abnormal mobility and crepitus may be absent in fracture of the pelvis. In the series of cases reported 50% of the patients died. A table giving the cause, diagnosis, complication, operation, and result in each case is appended to the author's paper.

Fig. 38.—Fracture of the fourth metacarpal bone, showing the rubber-tube splints in place (Beck, in N. Y. Med. Jour., Aug. 4, 1900).

E. H. Bennett [3] reports 2 cases of **fracture of the pelvis** in which the acetabulum was burst inward by the head of the femur. In one of these cases a series of incomplete fractures radiated from the acetabulum, so that the diagnosis could not be made during life.

J. E. Owens [4] reports 3 **rare complications of hip-joint fracture.** The first patient was a young man, who had fallen 22 feet, striking on his right foot. The leg was turned in and by rectal examination a prominence of the floor of the acetabulum was discovered. A skiagram revealed a fracture of the femoral neck and of the rim of the acetabulum with a subluxation of the head of the femur. The second case was that of an old man who presented a fracture of the neck of the left femur. He was never able to flex the left foot upon the leg, although both the ankle- and knee-joints were uninjured. This was due to paralysis of the external popliteal nerve from pressure of the adhesive straps and bandages. The third patient, a man 73 years of age, fractured the neck of the right thigh bone. Phlebitis appeared in the uninjured leg 64 days after the injury. When this had subsided the right leg was similarly attacked.

J. H. Ewart [5] reports a case of **mollities ossium with spontaneous fracture of the great trochanter of the left femur.** The

[1] N. Y. Med. Jour., Aug. 4, 1900.
[2] Ann. of Surg., June, 1901.
[3] Dublin Jour. Med. Sci., Dec. 1, 1900.
[4] Ann. of Surg., June, 1901.
[5] Lancet, Jan. 5, 1901.

patient was a woman, aged 65, who had suffered with the disease for 14 years. It began with a thickening of the left ankle and extended up the leg. The fracture occurred while the patient was walking. A large amount of callus was subsequently thrown out and osseous union had taken place by the ninth week.

N. Kaefer [1] employs the following simple apparatus for **fractures of the leg.** It is constructed of two strong corrugated iron braces about 10 centimeters long by 1.8 centimeters wide. It is slightly elbowed at the end, where a screw is placed. This screw has a right thread at one end and a left thread at the other, and the middle serves as a nut for the approximation or separation of the braces. A plaster cast is applied and cut through circularly, leaving an upper and a lower half. The nut part of the screw is placed over this interval and the braces fastened by additional layers of plaster bandage. By turning the nut as much extension may be employed as is desirable.

Potherat [2] reports a case of **fracture of the os calcis** from muscular action. Through an incision the fragments were sutured with silver wire. Perfect union resulted.

R. Thompson [3] reports a case of **fracture of the os calcis by muscular force.** The broken fragment was retracted some 5 inches from the sole of the foot and the fragments could not be approximated. Through an incision the upper fragment was drawn downward and held in position by an encircling silver-wire suture. A good result ensued.

A. Wiener [4] details a method of treating **fracture of the patella** without operation. The leg is sterilized and placed in a posterior curved splint and the knee-joint copiously padded. The fragments are then surrounded by figure-of-eight turns of a rubber bandage drawn moderately tight. An ambulatory apparatus is then applied. After 4 or 5 days the exudate will have much lessened and the fragments may be retained in place by a reapplication of the rubber bandage.

G. G. Ross and M. I. Wilbert [5] publish a study of 500 **fractures of the extremities verified by radiographs.** Of these, 304 were fractures of the upper and 196 fractures of the lower extremity. Of 53 fractures of the hand, the phalanges were involved in 12 and the metacarpal bones in 41. Of 114 fractures about the wrist-joint, 28 involved the radius and styloid process of the ulna, and in 4 the injury to the radius was accompanied by a fracture of the ulna higher up. The radius alone was fractured in 38 cases, while fracture of the ulna alone was present in 8, and 36 included one or more of the carpal bones. In 4 of the latter cases carpal fracture was accompanied by a fracture of the radius, in 3 by a fracture of the ulna, and in 1 by a fracture of both bones of the forearm. The bones of the forearm were involved in 26 of the cases; of these, 12 were fractures of both bones, while in 9 the radius and in 5 the ulna alone were found broken. Of the 65 fractures into or near the elbow-joint, 5 were of the olecranon, and 7 of the coro-

[1] Centralbl. f. Chir., Jan. 5, 1900.
[2] Gaz. Hebdom. de Méd. et de Chir., Nov. 15, 1900.
[3] Lancet, Oct. 20, 1900.
[4] Centralbl. f. Chir., Jan. 5, 1901.
[5] Phila. Med. Jour., Dec. 29, 1900.

noid process, and 2 included both the olecranon and the coronoid process; one was a fracture of the coronoid with involvement of the head of the radius, while another had a fracture of the coronoid with an extensive injury to the lower end of the humerus. Fractures of the coronoid are somewhat difficult to recognize from clinical data alone, and formerly they were thought extremely rare; in this series we have a total of 12 cases, making an average of 2.4% of the fractures—a high percentage for what was supposed to be a rare fracture. The head of the radius was found fractured in 5 cases, while the same injury accompanied by a fracture of the outer condyle was present in two instances. The condyles of the humerus were found injured in 41 cases as follows: 9 of the inner, 16 of the outer, and 15 of both, and in 1 case a longitudinal fracture into the lower end of the humerus was found. The shaft of the humerus was broken in 10 cases, while the same bone at or near the head was fractured in 8 of the 36 injuries about the shoulder-joint. In addition to the 8 mentioned above, the humerus was involved in 2 cases of fracture of the acromion. There were 13 fractures of the clavicle; 4 of these were accompanied by more or less extensive injury to the acromion. The scapula alone was broken in 13 cases; 3 of these fractures were confined to the acromion, and 2 to the coracoid process. The hip and thigh were involved in 15 cases; of these, 8 were fractures of the shaft of the femur, while the upper portion of the bone including the neck was broken in 7 cases. Of the 18 fractures at or about the knee, 5 involved the patella, 4 the femur, 2 both the tibia and fibula, and 7 the tibia alone. The leg was found broken in 34 cases. Of these, both bones were fractured in 24, the tibia in 4, and the fibula alone in 6 of the cases. Here, as in the case of the other long bones, the tendency of the line of fracture, especially when at or near the middle of a shaft, seems to be rather more transverse than oblique. There were 76 fractures at or about the ankle. Of these, 17 involved the inner and 23 the outer malleolus, while 17 included both malleoli; one or more tarsal bones were involved in 19 cases; 1 of these was accompanied by a fracture of the fibula, and 3 by fractures of the tibia. The foot was injured in 33 cases, including 25 fractures of the metatarsal bones, 5 of the tarsal and metatarsal, 1 of the metatarsal bones and phalanges, and 22 of the phalanges alone.

Von Mangoldt[1] reports 2 cases of **transplantation of perichondrium of the rib to cover a laryngeal defect.** An inch of the cartilage of the eighth rib was resected, split in half, and placed under the skin of the proposed flap, which should later cover the defect. Six months later the skin flaps containing the cartilage were swung into place. A year later the transplanted cartilage was in good condition.

N. Senn[2] reports a case of **restitution of the continuity of the tibia by transplantation of the patella into an extensive osteomyelitic defect.** Implantation of bone from the lower animals has been studied experimentally on a large scale, but it, together with the large clinical material which has accumulated, demonstrates the utter useless-

[1] Arch. f. klin. Chir., Bd. LXI, S. 955. [2] Phila. Med. Jour., Oct. 27, 1900.

ness of this procedure in effecting bone repair in man. The transplantation of small pieces of bone from one human being to another has been performed repeatedly with success; but such opportunities are seldom presented, so one has to rely on autotransplantation for the repair of large bone defects. Senn has repeatedly filled in limited defects of long bones with chips removed from the surface of the bone ends. It is important to preserve the periosteal envelop to be used as a covering for the bone grafts over which it is sutured with absorbable material. For extensive defects larger pieces of bone with vascular connection must be used. The case reported was one in which the patella was utilized for the first time for the restoration of a large osteomyelitic defect of the tibia. The patient was an 11-year-old boy from whom the entire shaft of the tibia had

Fig. 39.—Osteomyelitic defect of the tibia and external incision for transplantation of the patella (Senn, in Phila. Med. Jour., Oct. 27, 1900).

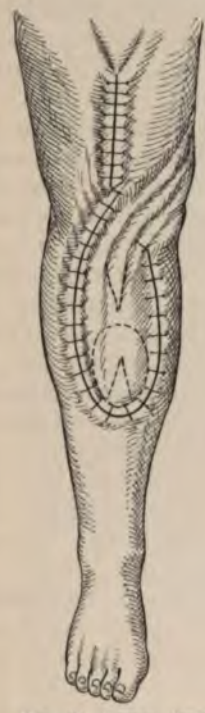


Fig. 40.—Lower fragment impacted into the upper border of the patella; wound sutured (Senn, in Phila. Med. Jour., Oct. 27, 1900).

Fig. 41.—Impaction of upper fragment with the upper patellar fragment (Senn, in Phila. Med. Jour., Oct. 27, 1900).

been removed for extensive osteomyelitis. When suppuration became reduced to a minimum, implantation of the tibia of a young rabbit was resorted to on two occasions, with a complete failure in both instances. The knee-joint had now become ankylosed, and it was decided to utilize the patella to restore the continuity of bone. After clearing out the infected granulations, the gutter for the reception of the patella was deepened by a vertical incision. The patella, with the overlying skin, was included in a horseshoe-shaped flap with the concavity downward and transplanted into the gap between the two fragments, in such a manner that the upper border of the patella was

brought in contact with the lower fragment. As the patella was not long enough to span the gap, the upper border was perforated with a drill and the lower fragment impacted into the perforation, leaving a space between the lower border of the patella and the upper fragment. The patella united with the lower fragment by bony union. A few months later the patella was exposed, divided obliquely, and the upper fragment mobilized sufficiently to bring it in contact with the upper end of the tibia, which was impacted into a perforation made by the drill. The patellar fragments were united by strong catgut sutures. Bony union again took place between the upper patellar fragment and the upper end of the tibia, but a false joint formed between the patellar fragments. Later this fibrous union was excised and the patellar fragments united by silver wire, bony union taking place. The patient is able to walk about with the aid of a cane.

Thevinot [1] says **endothelioma of bone** is found more frequently than is generally supposed. It may attack any bone. It is often developed in spongy tissue and frequently in the extremity of a long bone. As a rule it is encapsulated, but varies in consistency from a fluctuating mass to one of bony hardness. On section it resembles muscle and presents a number of dilated blood-vessels. Large cavities may exist in the center, and may account for the pulsation, bruit, and for the fact that the growth may be reduced by pressure. Osseous lamellas are entirely absent. The growth may occur at any age. It is uninfluenced by sex and appears insidiously and is painless. Attention may be first called to the growth by the occurrence of a spontaneous fracture. The superficial veins are not enlarged. Other bones, and exceptionally the lungs, may be the seat of metastases. The disease is as malignant as sarcoma, the patients living only from 6 to 19 months. The growth should be removed if small and discovered early. An amputation should be performed if the growth is of large size.

Marmaduke Sheild [2] reports a central **tumor of the shaft of the radius** treated by enucleation. It followed an injury 10 years before, was situated midway between the elbow and the wrist, and was of stony hardness. The circumference at the widest part was 7½ inches. The wall of this growth was very thin and its cavity was divided into loculi. A large section of the wall was removed, and the contents, which were soft and yellowish, were scooped out with a spoon and pure carbolic acid applied. A microscopic report showed the growth to be a myxochondroma with recent sarcomatous changes. The cavity was slowly obliterated by cicatricial tissue.

E. O. Croft [3] reports a case of **osteomalacia showing the effect of oophorectomy in checking the elimination of phosphates by the urine.** Following Curato and Tarulli's suggestion that the internal secretion of the ovaries has the power of oxidizing the compounds of phosphorus, such as those which exist in bones, so that after removal of the ovaries there is an increased deposit of calcium and magnesium phosphate in the bones, which thus become stronger, Croft removed the

[1] Rev. de Chir., June, 1900. [2] Lancet, Jan. 12, 1901. [3] Lancet, Aug. 25, 1900.

ovaries in a woman 35 years of age, who was a sufferer from osteomalacia. There was a diminution of from 20 to 30 grains of phosphoric acid per day following the operation.

E. H. E. Stack [1] gives the autopsy findings of a case of **leontiasis ossea.** The skull weighed 8½ pounds, was 3 inches thick in some places, but appeared normal in shape in its interior. The brain was unaffected. The spine, pelvis, and femora were also distorted, but not enlarged. The liver was fatty, cirrhotic, and possibly syphilitic. The thyroid contained a mass which resembled the appearance of the gland in exophthalmic goiter.

Fig. 42.—Skiagram of tumor showing loculi formed by thin bony septa (Sheild, in Lancet, Jan. 12, 1901).

Osteomalacia.—M. Gayet and M. Bonnet [2] conclude an article as follows: (1) Osteomalacia is a trouble of nutrition of the bones, consisting in a deficiency of lime salts and leading to softening of the skeleton. This trouble may be local or general. (2) Local osteomalacia is observed to follow traumatisms, osseous infections, and also certain nervous diseases. (3) The anatomical lesions are similar in the local and the general forms. They are not uniform, but present varieties which are not in any relation with the seeming etiology, the clinical variety, or the degree of generalization of the disease. (4) The pathogenesis has no specific character. (5) There are predisposing causes evident, related to age, sex, climate, etc. (6) The determining causes remain obscure, but the totality of facts seems to assign the most important place to troubles of the nervous system. (7) A plausible explanation of the satisfactory effects of castration is

[1] Bristol Med.-Chir. Jour., Dec., 1900. [2] Rev. de Chir., Feb., 1901.

found in the fact that the internal secretion of the ovaries results in increased activity of the elimination of phosphates.

JOINT DISEASES AND DISLOCATIONS.

V. Chlumsky [1] writes on **restoration of motion after ankylosis of the joints.** He points out the inefficiency of the usual treatment for mere ankylosis. Of 14 cases treated in the Breslau Clinic, not 1 showed a marked gain in function. Ankylosis is due to involvement either of the soft parts or of the bone, but is most commonly due to a combination of both these factors. The stiffening due to the soft parts may be remedied by passive motion and massage, but osseous ankylosis requires such violent force to induce motion that hemorrhagic exudation will surely occur, necessitating rest with a consequent recurrence of ankylosis. Some means must be taken to prevent the bony tissues from growing together after being forcibly separated. Taking the idea from nonunion due to interposition of muscle or fascia, which is often seen after fractures, he conducted a series of experiments on dogs and rabbits, interposing plates of celluloid, silver, tin, rubber, etc., after resection of a joint. The joints were opened at periods varying from several weeks to 4½ months after the introduction of the foreign body. They showed an attempt at normal joint-formation, as the surfaces had become smooth, coated with a thin lamina of cartilage, and bathed with serous fluid. The periarticular structures were thickened. Rubber and celluloid remained undisturbed, but the tin and silver plates were disorganized. Because nonabsorbable substances so frequently give rise to unpleasant sequels after operation, it is suggested to use decalcified bone, ivory, or magnesia for separating the bony surfaces.

P. A. McIlhenny [2] reports a case of **ankylosis of the temporo-maxillary articulations** following mercurial stomatitis. The joints were completely ankylosed and the jaws held firmly together by adventitious bands on the inner surface of the cheeks. Each side was operated on in the following manner: After making an Esmarch incision and turning back the flaps, a wedge of bone, about a half-inch in diameter at the base, with the apex pointing in the sigmoid notch, was removed from the neck of the condyle just above the insertion of the external pterygoid. At the end of the third day passive motion was begun with the mouth-gag, and later active motion with chewing-gum. The adventitious bands caused these motions to be very painful and were therefore severed. The patient is now able to chew his meals for the first time in 15 years.

Drehmann [3] says that in **congenital luxation of the knee-joint** the capsular and conical ligaments are stretched and the patella is usually small and sometimes absent. Of 127 cases, in 102 the tibia was dislocated forward and in 54 the condition was unilateral. The cause of dislocation he believes is fixed hyperextension during fetal life, the

[1] Centralbl. f. Chir., Sept. 15, 1900. [2] New Orl. M. and S. Jour., Apr., 1901.
[3] Zeit. f. orthop. Chir., Bd. III, H. 4.

limb continuing to develop and so producing a luxation of the tibia. The prognosis is not so grave as in congenital dislocation of the hip. The treatment consists in placing the parts in their normal position and maintaining the limb in a flexed posture for several weeks.

C. F. M. Althorp [1] reports a case of **irreducible dorsal dislocation of the proximal phalanx of the index finger.** Reduction was finally accomplished by partially severing the glenoid ligament which was found to be stretched over the head of the metacarpal bone, and then with a blunt elevator levering the stretched band over the metacarpal head. Perfect use of the finger followed.

S. V. Merritt [2] reports a case of **simultaneous subglenoid dislocation of both shoulders** in a woman aged 60, who fell 3½ feet from a stepladder with both arms extended over her head.

S. Gross [3] records a case of **separation of the chondrosternal junction without fracture.** The patient had been violently assaulted by a fellow-workman. At first no deformity was apparent, but on the fifth day, when breathing had become much more free, a distinct click could be heard and felt with the respiratory movements, and the second costal cartilage was found to be free from the sternum, at the side of which it formed a small prominence.

Loison [4] maintains that in old **backward dislocations of the ulna and radius** at the elbow, **resection** is the only treatment which will give a good functional result. Passive motion, massage, and arthrotomy are unavailing because of the formation of bony outgrowths. The lower end of the humerus should be resected and the upper ends of the ulna and radius, together with the attachments of the biceps and brachialis anticus, should be preserved. He reports 2 cases treated by the above method.

W. Lathrop [5] reports a case of **compound dislocation of the knee-joint** produced by a railroad accident. The left femur was shattered at the condyles while the right femur protruded at the under side of the knee completely denuded of tissue. The popliteal artery was ruptured. The patient recovered after amputation of the limb.

G. W. Ord [6] publishes a case of **presumed rupture of the anterior annular ligament of the ankle-joint.** A boy of 13 had twisted his right ankle while bowling at cricket. The big toe could be extended fairly well, but not so well as its fellow on the sound limb. The second, third, and fourth toes could not be raised from the ground, although he was able to communicate motion to them, and the little toe was immobile. The battery was applied to exclude the possibility of ruptured tendon. A separation of the outer portion of the anterior annular ligament, which acts as a fulcrum for the extensor tendons, would explain the symptoms. There was a slight amount of puffiness just internal to the external malleolus. After 7 weeks of strapping, extension of the toes could be performed perfectly.

[1] Lancet, Mar. 9, 1901.
[2] Phila. Med. Jour., July 7, 1900.
[3] Brit. Med. Jour., July 7, 1900.
[4] Rev. d'Orthop., No. 2, 1900.
[5] Med. News, Feb. 23, 1901.
[6] Lancet, Sept. 29, 1900.

John F. Erdman [1] describes the following method of reducing **dislocations of the thumb,** which he has used for the past 14 years without failure in a single instance. In cases of dorsal displacement the operator places his thumbs at the base of the proximal phalanx and the cushions of his index fingers on the distal extremity of the metacarpal bone. The forces are then applied in opposite directions, the index fingers pull the metacarpal bone in a condition of extension or abduction, while the thumbs raise and push the phalanges in a position of flexion. Should the dislocation be volar, which is rare, the procedure with reference to the operator's thumbs and index fingers is reversed, the thumbs lifting and extending the distal phalanges and adduction or inflection of the metacarpal bone is made by the index fingers.

H. L. Barnard [2] reports an **irreducible dorsal dislocation of the first phalanx of the little finger** produced by the fall of a heavy hammer upon the back of the hand. All efforts at reduction were unavailing, the bone being finally replaced by entering a narrow-bladed knife on the dorsal surface of the dislocated joint to the ulnar side of the extensor tendon and carrying the back of the blade along the back of the articular surface of the base of the phalanx until the point of the knife impinged against the back of the metacarpal bone. A firm cut upward for the distance of about ⅛ inch was then made, dividing the glenoid ligament upon the back of the metacarpal head.

Joseph Griffiths [3] makes some observations upon injuries to the **internal lateral ligament** and to the **internal semilunar cartilage of the knee-joint,** the result of a study of clinical data and experiments on the knee-joints of cadavers. In the normal knee-joint there is no lateral movement in any position of the joint. There is, however, rotation of the tibia upon the femur when the joint is fully flexed. Bending inward of the knee-joint is prevented by the internal lateral ligament in the extended position and by the crucial ligaments in the flexed position, the internal lateral ligament being in the latter position relaxed to allow rotation of the tibia upon the femur. The most common attitude when a person makes a great effort is that in which the limbs are slightly bent, with one foot slightly advanced, and the other drawn back with the limb rotated outward, and in this position the severest strain is borne by the internal lateral ligament of the posterior limb. Such a strain is increased when the body tends to turn upon the hinder limb, when this ligament may be unequal to the strain and be torn or overstretched. The author believes the internal lateral ligament to be the most frequently damaged structure in the knee-joint. It may be recognized by an area of excessive tenderness and by testing for lateral movement in the joint. When a knee-joint is distended with fluid, lateral movement may be obtained; so the latter sign is of value only before the effusion occurs or after it has been absorbed. These joints are frequently insecure for a long time following injury, the time being measured by months or years rather

[1] Med. Rec., Mar. 2, 1901. [2] Lancet, Jan. 12, 1901.
[3] Brit. Med. Jour., Oct. 20, 1900.

than by days or weeks. To hasten a return to normal by preventing any interference with healing as a result of lateral motion, the author recommends an apparatus which consists of two flat bars of steel about 1 inch in width, which are fixed together by a free hinge joint which lies horizontally at the middle of the back of the knee. Each bar at the distance of a half-inch from the joint is split longitudinally into equal halves; the bars are then opened from the center, and at a distance of 1½ to 2 inches from the hinge are gently curved outward and forward until they encircle the limb for nearly three-fourths of its circumference. Each bar is closely applied on its face to the skin surface, and is of an oval shape in transverse section, so as to diminish the weight without decreasing to any material extent its strength. The bars diverging from the joint behind are so placed as to resist any lateral pressure. To the anterior ends of these bars four large, thin, adjustable aluminium plates

Fig. 43.—Back view of splint applied to left knee (Joseph Griffiths, in Brit. Med. Jour., Oct. 20, 1900).

Fig. 44.—Side view of splint applied to knee (Joseph Griffiths, in Brit. Med. Jour., Oct. 20, 1900).

are fitted. These plates are inclosed in leather, and by means of straps the upper and lower pairs of plates are joined behind and in front of the limb. The lower pair come just below the head of the fibula externally and just below the head of the tibia internally. The upper pair come just above the condyles of the femur. Such an apparatus for a man weighs between 9 and 10 ounces and for a woman about 7 ounces. By this apparatus rotation is prevented and flexion can take place to the degree of a right angle. The internal semilunar cartilage is fixed in front and behind at each extremity to the tibia. Near the middle it is firmly fixed to the capsule of the joint and internal lateral ligament. At its circumference it is loosely attached to the tibia, allowing the cartilage to be lifted from this bone at least a quarter of an inch. For the cartilage to be displaced in the extended or semiextended position of the knee, the internal lateral ligament must be rendered ineffective by rupture or overstretching. This will allow the articular

surfaces to be separated about one-third of an inch, a space sufficiently large to accommodate the passage of the cartilage in between the two bones. To replace the cartilage the writer suggests that the knee be flexed laterally to relieve the cartilage from pressure when it is probable that the cartilage from its own elasticity will spring into place. To prevent recurrence the apparatus already described is recommended.

S. L. West [1] writes on **chronic villous arthritis.** This peculiar morbid process is principally confined to the villi of the synovial membrane resulting in a chronic hyperplasia. These villi are generally firm, but may be soft and slippery. In a freshly opened joint they appear reddish or bluish-red in color. The cause of this condition is not known; the family history is usually negative. It occurs most frequently in adult life. Tuberculosis is not a factor, but trauma has been noted in the monarticular form. The joint is enlarged, its function impaired, and there may be deformity. There is pain, but no abnormal heat or discoloration. Synovial effusion is rare, and the ligaments, cartilages, and bones are seldom involved. Treatment consists of rest and local applications or excision of the hyperplastic villi, with irrigation of the joint.

Charles A. Porter [2] read before the Massachusetts Medical Society, June 13, 1900, a paper on **septic and gonorrheal joints.** Concerning the diagnosis, he says most difficulties occur in the cases of so-called idiopathic arthritis, in which the infection is cryptogenic, the organisms securing an atrium through the tonsils, pharynx, intestinal tract, or some small wound. General symptoms and great pain precede the signs of local infection, thus differing from rheumatism. Edema appears early and extends rapidly. Redness occurs later than in acute rheumatism. The joint capsule or periosteum may be perforated when fluctuation becomes evident. Though more than one joint may be involved, the condition is usually monarticular. Salicylates have little effect on the pain. In doubtful cases the joint should be unhesitatingly punctured for bacteriologic examination. As a rule metastasis occurs from 2 to 6 weeks after the original infection, but months and years may elapse. He calls attention to the frequent negative bacteriologic findings in many cases of gonorrheal arthritis, and to the fact that females are more frequently afflicted with joint complications than is generally supposed. Recent statistics show that more than one joint is involved in 60 % of cases, although one usually bears the brunt of the infection. The knee, ankle, and elbow suffer most frequently. The small joints of the hand and foot, the jaw, spine, and sternoclavicular articulations are affected more often than in rheumatism. Tendon-sheaths and bursas are favorite haunts for the gonococci. Trauma and overexertion are predisposing causes. Curetage, the passage of a sound, or too vigorous local treatment may precipitate a metastasis or make an existing joint-lesion worse. Exposure to cold and wet exercises no influence. Except for the tenderness and acute onset, the gonorrheal joint strongly suggests a tumor albus. In reviewing the cases in which the gonococci were found in the effusion, all of them were relatively fresh cases

[1] Phila. Med. Jour., Dec. 15, 1900. [2] Boston M. and S. Jour., Oct. 18, 1900.

or those in which recurrence had taken place. No mention is made of gonococci found in chronic synovitis. Of the many drugs which have been advocated, none is of much value. Urethral treatment should be begun at once. Absolute immobilization of the joint by appropriate splints is the best treatment in the acute stage. At intervals, under an anesthetic, after the acute condition subsides, the joint may be once fully flexed and extended and allowed to rest for a couple of days, when active and passive motion should be continued. When the joint is greatly distended, it may be aspirated. As relatively few pure gonorrheal infections lead to suppuration, the treatment by immobilization and early passive motion is safer than operation for general adoption. When pus can be demonstrated, then only should operation be adopted.

J. Coplin Stinson [1] reports a case of **acute gonorrheal arthritis of the left shoulder** which began about 40 days after the original infection. Ten days later the joint was opened by an anterior incision, permitting the escape of an ounce of turbid fluid. The center of the head of the humerus over an area of about ½ inch was rough. The joint was thoroughly irrigated and drained. The specimens taken at the operation did not reveal gonococci, but 2 days later they were found in the discharge from the joint. The cure was complete in every detail at the end of 2 months.

Chas. A. Powers [2] reports a case of **acute suppurative synovitis of the knee-joint** which was opened and drained according to the method of Hueter, the patient not improving after this procedure. Two days later the joint was opened by the usual curved incision and the entire synovial membrane, which was semigangrenous, excised. The semilunar cartilages, patella, and crucial ligaments were also removed. The cause of this condition was unascertainable. At the end of 3 months the entire wound was healed, the joint being ankylosed in a position a trifle flexed.

G. Trunezek,[3] after discussing the various surgical methods of treating **tuberculous osteoarthritis,** says extirpation is not always advisable and that the Bier method is inadequate when sinuses exist. Zinc chlorid as a caustic is dangerously destructive, and does not thoroughly permeate the various sinuses. An ideal caustic for such cases should be a liquid actively caustic, with great powers of penetration, and nontoxic. He believes the following formula will meet these requirements: Sodium sulphate, 1.46 grains; sodium chlorid, 16.40 grains; sodium phosphate, 0.50 grain; sodium carbonate, 0.70 grain; potassium sulphate, 0.94 grain; water, 80 grains. This fluid is composed of salts which are found in the blood, and which, if absorbed, should be quickly eliminated. As much as a quart of a 25% solution has been employed without toxic effects. The skin is first protected with boric acid ointment and the fluid forced into the sinuses until it returns clear. A 10% iodoform-emulsion is then used. The reaction is always great, the treatment painful but efficacious. During the stage of reaction the parts

[1] N. Y. Med. Jour., July 7, 1900. [2] Med. News, Dec. 1, 1900.
[3] La Semaine Méd., July 11, 1900.

are put at rest and cold applied. By this method of treatment no blood is lost, the healthy tissues are not opened to the tubercle bacilli or inflammatory products, the fluid acting on the diseased tissue alone. It is not indicated when there is a sequestrum.

Phelps [1] writes on the **treatment of tuberculous and purulent joints with large glass-speculum drainage and the application of pure carbolic acid.** He says that clinical observation does not bear out the theory that interference with purulent and tuberculous foci will result in constitutional infection, as he has never seen a case followed by such a result. Joint abscesses should be treated in precisely the same way as other abscesses are treated. Pure carbolic acid, when applied to the tissues, forms an albuminate which is a powerful antiseptic and is absorbed by the lymphatics of the part. The abscess-cavity is exposed by a free incision and the joint explored. If there is extensive bone-disease it is cureted and the cavity irrigated with bichlorid solution. The joint is then filled with pure carbolic acid, which is allowed to remain 1 minute by the watch, after which the joint is thoroughly washed out with pure alcohol and finally the alcohol is washed away with a 2% solution of carbolic acid. The largest sized glass drainage-tube that can be introduced is placed in the joint, the end being flush with the skin.

Ahrens [2] reviews the literature of the **surgical treatment of Charcot's joints,** and reports 3 cases. Of 18 cases in which resection was performed by Ullman, 10 affected the knee-joint, and 9 only were surely tabetic. Of these 9 all resulted unfavorably, 2 of the patients dying shortly after operation, 3 requiring a later amputation, in 1 nonunion resulted, and of the remaining patients no later report is given. He believes operation to be indicated only when a tuberculous or suppurative process complicates the existing disease. In his own cases he applied an apparatus which allowed the patients to walk with ease.

Tilmann [3] reports the case of a man aged 22, who gave no history of a blood dyscrasia, but who presented a **hemophiliac knee.** Following a trivial injury the left knee became swollen and painful, the condition relapsing during the course of 3 years. The case was believed to be an arborescent lipoma. At the operation 36 soft elastic bodies, varying in size from a pea to an almond, were discovered. The following day the joint began to bleed. The bleeding, which consisted of a general ooze, persisted despite all efforts to check it, the patient dying in 3 weeks from hemorrhage. The elastic bodies proved to be fibrin clots.

Delbet [4] reports a case of **dislocation of the face** in a man 25 years of age, who fell from a scaffold, striking on a beam and driving his cranium forward, at the same time embedding a cross-bar in the nasofrontal depression. The frontal bone was separated from the nasal bones 4 centimeters, and by placing a finger in the mouth, the pterygoid processes were found to move with the loose upper jaw. The dislocated part included the upper jaw, malar, nasal, vomer, and palatine bones, part of the ethmoid, and the pterygoid processes.

[1] N. Y. Med. Jour., Sept. 15, 1900. [2] Zeit. f. orthop. Chir., Bd. VII, H. 2.
[3] Deut. Aerzte-Zeit., Oct. 1, 1900. [4] La Semaine Méd., Oct. 24, 1900.

VENEREAL DISEASES.

In an editorial the "Journal of the American Medical Association," April 6, 1901, discusses the **prevention of venereal diseases.** The Committee of the Section on State Medicine of the American Medical Association appointed to investigate the time when a patient who has had gonorrhea may marry, and whether the matter is a proper one for regulation by statute, decided that marriage is permissible when it is positively proved that the patient is no longer infective, and that "it is doubtful whether any plan of examination of prostitutes or any plan requiring a report to health authorities of cases of gonorrhea occurring in the hands of general practitioners and specialists can be made practicable." L. D. Bulkley submitted a plea that syphilis, because of the peril to the innocent as well as to the transgressor, be, like other transmissible diseases, placed under the control of the health authorities. The keynote of the situation is the education of the public upon the subject, in order that they may appreciate the dangers, and apply the preventive and corrective measures both individually and collectively. The German Department of Education has a series of public lectures on syphilis and gonorrhea delivered by authorities at the Charity Hospital of Berlin, which, after being published in the "Berliner klinische Wochenschrift," are reprinted and distributed among the students and soldiers. A course of free clinical lectures on syphilis for physicians has been delivered at the New York Skin and Cancer Hospital. Regulation will always be a most difficult undertaking. Results cannot be secured by individuals.

E. H. Freeland [1] advocates universal **circumcision as a preventive of syphilis and other disorders.** The operation is safe, does not interfere with the well-being of the individual, and prevents a host of evils—dysuria, enuresis, retention of urine, balanitis, constriction of the glans, hernia, rectal prolapse, difficulty in sexual intercourse, aggravation of gonorrhea, liability to contract masturbation, and many nervous symptoms. But it is to the prevention of syphilis that the author directs his closest attention. Various pockets which exist around the glans are smoothed out by the operation and the epithelium of the glans becomes dry and thickened, offering an additional barrier to infection. Of 330 cases of venereal disease, but 58 occurred in Jews, 47 being urethritis and 11 syphilis. This proves that their comparative immunity is not due to virtue, because gonorrhea is more frequent in them, but to the fact that they are circumcised. Of 898 initial lesions, 659, or 73.3%, were on the prepuce just behind the corona. According to Hutchison, only 5 of 97 women suffering from venereal disease were Jewish. Of 252 children, 179 Christians presented 27 cases of congenital syphilis and 73 Jews gave but 3. Concerning the operation, the author believes that too little skin is frequently amputated, it being essential to obliterate all folds. A wedge-shaped piece of the frenum should always be removed, thus removing the hollow on either side of

[1] Lancet, Dec. 29, 1900.

it and preventing the edematous nodule which is liable to form at this point.

The Boston Society for Medical Improvement[1] discussed **gonorrhea,** December 31, 1900. Benjamin Tenney read a paper on **gonorrheal infection.** Every case of urethritis which lasts more than a few days is or may have been at the start an infection by the gonococcus. It is admitted that mild and transient inflammations of the urethra do occur in the course of fevers, gout, and rheumatism, and are acquired from instruments and sexual contact. Guiard reports cases developing during typhoid, secondary syphilis, malaria, rheumatism, and gout in which no gonococci could be found. He quotes 30 cases from literature in which a urethritis lasting a few days showed no gonococci in the discharge. Guiard has never seen an acute case not primarily due to the gonococcus, though in some cases the infecting agent may have contained only a toxin which lowered the resistance to less virulent germs. The gonococci first develop on and in the epithelial cells, then in the subepithelial tissue, and finally again in the epithelium, as a barrier to their growth is produced beneath them. This agrees with the investigations of Bumm, who studied slides from the conjunctivas of babies infected during delivery. In 12 hours the organisms were in the epithelial cells; from the third to the sixteenth day, in the leukocytes and subepithelial tissue; on the eighteenth day, in the superficial layer; on the twenty-third day, on the surface in detached epithelium; and on the thirty-second day no gonococci were found. While this germ may reproduce itself in a pocket of the urethra for months and even years, it usually disappears within 3 to 5 months. The normal urethra contains diplococci which with the methyl-blue stain resemble the gonococci. In the declining stage, when the pus cells must be found on the threads or by sedimentation, the greatest accuracy with the Gram stain is necessary. Infection and the persistence thereof is favored by gout, tuberculosis, and alcoholism. Excepting these three conditions, the usual result of careful treatment is a complete cure. Infection of a wife by a husband who has had no visible discharge is uncommon. Every patient should, however, make sure before he marries that he is free of the disease. Christmas experimentally produced a toxin and an antitoxin; the latter, when introduced into the human urethra, produced a scalding sensation and was followed by a mucopurulent discharge which did not contain the gonococcus. As the damage in this disease is ordinarily produced by the organism itself rather than by its toxin, the use of an antigonotoxin would probably be limited to those cases exhibiting constitutional symptoms. The author thinks that about 20% of the males and 5% of the females of the community have suffered with gonorrhea. The general impression is that one attack predisposes to another. There is little literature bearing on this point. Judassohn introduced fresh gonorrheal pus into the urethras of 6 patients suffering with a chronic attack. In 2 the disease again became acute. Oscar Richardson read

[1] Boston M. and S. Jour., Feb. 7, 1901.

a paper on **the bacteriologic diagnosis of the gonococcus.** The important point is the decolorization by the Gram method. The morphology and the position inside the leukocytes are not necessarily characteristic. In a cover-glass examination the pus should be thinly smeared with a platinum loop and the anilin oil gentian-violet solution should not be more than 2 weeks old. Culture methods may detect the presence of a small number of organisms, but a negative result from gonorrheal shreds does not exclude gonococci. The cover-glass examination when applied to inflammatory processes outside the urethra is of little value, a culture test being necessary, the organism growing on special media in colonies of a certain appearance, decolorizing by the Gram method, and showing a tendency to group in tetrads. Concerning the negative results on bacteriologic examination of extraurethral inflammations supposed to be gonorrheal, it is said the organisms have been destroyed. Dead gonococci have pyogenic properties. Franklin G. Balch contributed an essay on **the treatment of gonorrhea.** He thinks a case should be treated twice a day during the first week, and that then the patient should himself use an injection twice or thrice daily for 2 or 3 weeks longer. He has confidence in but three drugs—nitrate of silver, permanganate of potassium, and protargol. During the first week he uses silver nitrate, increased from 1 to 3 grains to the ounce. The patient is allowed to pass his urine to wash out the discharge, and then the urine (which precipitates silver) is washed from the urethra with sterile water before the injection is given. If at the end of a week or 10 days the discharge has ceased, the patient is allowed to inject himself with permanganate of potassium, 2 grains to 16 ounces of water. When it is impossible to see a patient as often as this method requires, he should be given a 0.5% solution of protargol, to be injected 3 times a day for the first 10 days, then at longer intervals until a cure is effected. It may be necessary to give a mild astringent injection at the end of an attack to get rid of the slight morning discharge; for this purpose he uses sulphate of zinc with hydrastis. When the patient presents himself after the disease has fully developed, it is safer to give no injections for a time, but to rely on internal medication. The potassium salts, water, salol, methylene-blue, oil of sandalwood, and urotropin are mentioned. W. L. Burrage discussed **gonorrhea in women.** The gonococcus requires air, thrives best in alkaline media, and lives in columnar, not pavement, epithelium. The phagocyte is not his special enemy. The author, with Sanger, believes that 12% is a fair estimate of the frequency of this disease in women. It is said that cultures should take the place of cover-glass examinations for the detection of the gonococcus. In 2107 cover-glass examinations (Schwartz, Goll, Neisser, Winerich, Van Schaick, Brose, Schiller) of patients with a clinical history of gonorrhea, but 23% were positive. Absence of the coccus is no proof that gonorrhea is not present. Brose and Schiller think the clinical course more important than the finding of gonococci. Stricture of the urethra in the female is more common than is generally supposed. Gonococci

are found in 20% of the cases of pyosalpinx. A few gonococci may be multiplied into many at the menstrual period. The existence of a latent gonorrhea is still under discussion. Protargol in solutions of from 1% to 5% appears to be displacing silver nitrate as a standard remedy. Gardner W. Allen outlined **the treatment of chronic gonorrhea.** The inflammation becomes localized at the penoscrotal angle, at that portion of the pendulous urethra just anterior to it, the bulbomembranous juncture, the prostatic urethra, and less frequently the fossa navicularis. For stretching the contracting urethra the four-branch dilator of Kollmann is the best instrument to use, as it may be passed through a small meatus, and because the urethra is more tolerant of extreme dilation applied at one point than of a less degree applied throughout its length. This stretching also causes the absorption of cicatricial tissue and opens the follicles to medicaments. The author usually applies a half dram of a 10% or 20% solution of protargol. For applications through the endoscope, silver nitrate, 3% to 10%, gives the best results. If a stricture be present, it should be dilated at weekly intervals until the normal caliber of the urethra is restored before the endoscope may be used to much advantage. When the prostatic glands are involved, massage, practised when there is a small quantity of fluid in the bladder, is instituted. The fluid in the bladder is passed after the massage and examined for short clumpy shreds which come from the follicles of the prostate. Next the posterior curved dilator is passed, screwed up as far as the patient's comfort will bear, and an injection of protargol, silver nitrate, or potassium permanganate given. This procedure should be repeated once a week. In some cases improvement will only be noted after active local treatment has been stopped. Charles L. Scudder spoke of the **seminal vesicles in gonorrhea.** In 400 cases of gonorrhea, 32 had prostatitis, 15 prostatitis and vesiculitis, and one vesiculitis. Direct extension of the inflammation from the urethra to the vesicle is extremely rare, but an intensely acute inflammation may extend in this manner. In a few cases general peritonitis has followed vesiculitis, the peritoneum lying close to the summit of the vesicle. That infection of the vesicle may take place from the rectum is probable, as the colon bacillus has been found together with the gonococcus in vesiculitis. Fever, pain, and tenderness are present in vesiculitis. The pain may be referred to the kidney, bladder, spermatic cord, urethra, or sacrum. The tenderness may be suprapubic or be detected by rectal examination. The urine is often clear when the symptoms are severe, but becomes purulent with the subsidence of the symptoms, due to the emptying of the pus from the vesicular cavity. By rectal examination the vesicles are obscured by the general swelling of the surrounding tissue. Pus escapes into the bladder, rectum, or peritoneal cavity, or it may be absorbed. It should be evacuated through the perineum or rectum. Chronic vesiculitis is due to gonorrheal or tubercular infection. The symptoms are functional and neurotic. Many cases of gleet are probably vesicular in origin. The treatment should be massage through the rectum. Excision may be

employed in extreme cases, the vesicle being reached through the inguinal, perineal, or sacral route. In the inguinal operation the external oblique is split, the vas separated from the cord and followed extraperitoneally to the vesicle. In the perineal operation an incision from one ischial tuberosity to the other is made, the rectum and prostate exposed, the ejaculatory ducts divided from the base of the prostate by a transverse cut, and the vesicles seized and forcibly extracted. In the sacral operation an incision is made from the anus up along the edge of the coccyx to the level of the junction of the fourth and fifth sacral vertebræ, and then transversely across the sacrum. An osteotome divides the sacrum, and this triangular osteoplastic flap is raised, the rectum pushed to one side, and the base of the bladder with the attached vesicle exposed. Moderate distention of the bladder brings the vesicle nearer the surface. J. B. Blake details the treatment of **gonorrheal prostatitis.** Montagnon and Eraud estimate that the prostate is affected in 70% of the cases of posterior urethritis. Abscess is rare, only 11 cases having been admitted to the Boston City Hospital in 16 years. During the stage of congestion, rest, purgatives, dieting, heat to the perineum, hot rectal injections, opium and belladonna suppositories, and oleum santali for the accompanying cystitis are indicated. Abscess usually breaks into the urethra, rectum, or through the perineum, the frequency being in the order named; of 102 cases collected by Segond, 64 ruptured into the urethra, 43 into the rectum, 15 through the perineum, 8 in the ischiorectal fossa, and others in the groin, prevesical space, peritoneal cavity, abdominal wall, and pelvic foramina. In some of the cases the rupture was in two places. A urinary fistula formed in 10% of cases in which spontaneous rupture occurred. The mortality is variously estimated at from 3% to 30%. The treatment is incision through the perineum and drainage if the diagnosis be made before the abscess points into the rectum or opens into the urethra. Retention of urine, which is common in these cases, is best relieved by aspiration. The follicular type of prostatitis, characterized by the appearance of glairy mucus after stool or sexual excitement, is treated by cold baths, tonics, cold sounds, deep injections of silver nitrate, and prostatic massage. C. H. Williams presented the subject of **gonorrheal conjunctivitis.** It has been said that from one-third to one-half of the existing cases of blindness are due to gonorrheal infection. Every 15 to 30 minutes day and night the conjunctival sac should be irrigated with ½ to 1 pint of warm boric acid solution. A hollow lid-elevator, in which the fluid flows from a number of fine openings on its edge, has been devised. Ice compresses should be applied unless corneal complications arise. Silver nitrate in a 2% solution may be applied during the later stages of the disease. A 20% to 40% solution of protargol has been applied to the everted lids, but seems less reliable than silver nitrate. In patients of low vitality heat may be better than cold. The danger of corneal complications is greater in adults than in infants. In severe cases a canthotomy or vertical division of the upper lid may be demanded to relieve pressure on the cornea and insure proper cleans-

ing. When the cornea becomes involved, heat locally and atropin internally are indicated. The sound eye and the eyes of the nurse should be protected by mica shields. The mica shield over the patient's sound eye should be surrounded with gauze well plastered down by collodion. Paul Thorndike concluded the paper entitled "**When is a Gonorrhea Cured?**" by saying that the methods of examination at our command are fairly adequate to determine the contagiousness of an individual case; that the methods of treatment are fairly adequate in cases presenting remnants of disease; that these remnants should be treated whether they contain gonococci or not; and that in a few cases when a trace of discharge exists for which no cause can be found, marriage may probably be allowed after every effort has been made to demonstrate its noncontagiousness and after the possibility of future trouble has been explained. The writer usually obtains more than one opinion in a case of this character.

William A. Hackett,[1] in an article on the **complications of specific urethritis,** gives a table of 100 cases in which the complications were mentioned. Fifteen per cent. had adenitis, 9% acute prostatitis, 9% stricture, 8% epididymitis and orchitis, 6% balanoposthitis, 5% arthritis, 3% cystitis, 1% meningitis, 1% appendicitis, and 14% some other constitutional disturbance. Seventy-four of these cases were acute and 26 chronic. Under neuroses, cases of myalgia, perineuritis, cerebral and spinal meningitis, phlebitis of the femoral vein with cerebral embolism, peripheral neuritis, muscular atrophy, juvenile insanity, and neuroretinitis are mentioned as having been reported. Several observers have described gonorrheal stomatitis communicated by coitus *ab ore*. Cutaneous rashes have been produced by urethritis. Hackett maintains that gonorrhea is almost always a constitutional disease and that it always should be treated by rest in bed.

Alfred Schaler[2] reports a case of **persistent urethritis due to pseudophosphaturia.** The patient had contracted gonorrhea 4 years before; the disease persisted, and at the end of a year a stricture was cut by internal urethrotomy. No improvement followed. The urine was found to be loaded with a heavy white sediment. The addition of acetic acid caused effervescence and cleared the urine. Repeated examinations failed to demonstrate gonococci. Despite the alkalinity of the urine and the deposit of phosphates, the actual quantity of phosphates was not increased; the condition was pseudophosphaturia. Regulation of the diet with the administration of benzoic and hydrochloric acids had no effect, and it was only after urotropin was given in the dose of 30 grains a day that the discharge ceased.

Ramon Guiteras[3] has treated 150 cases of **urethritis with mercurol.** He believes that argonin is difficult to dissolve and that it is liable to decompose. But both argonin and protargol have given good results. Mercurol is a brownish-white powder, soluble in water, but not in alcohol. It does not precipitate albumin and is not pre-

[1] Phys. and Surg., Nov., 1900. [2] Medicine, Mar., 1901.
[3] Lancet, Sept. 22, 1900.

cipitated by alkalies. It is a compound of nucleinic acid with mercury, the nucleinic acid being obtained from yeast. Nucleinic acid, it is claimed, facilitates the action of mercury and renders it less irritating, so that the mercury may be used in much larger doses than would be otherwise possible. The best strength to use is 10 grains to the ounce, or approximately 2%. Of 65 cases of undoubted gonorrhea which were under treatment for 3 or more weeks, 10 patients, or 15%, were positively cured in 4 weeks; 15, or 23%, in 6 weeks and under; 20, or 30%, were practically cured in from 4 to 8 weeks, there being no discharge, but some shreds in the urine; and patients not cured in from 4 to 8 weeks, 20, or 30%. Only 2 patients suffered with complications, one developing arthritis and the other epididymitis. Many writers hold that in 20% of the cases of urethritis epididymitis occurs. In about 20% of cases of urethritis there are symptoms of inflammation of the posterior canal; it occurred in 1, or 1%, of those treated with mercurol. It is probable that mercurol quickly destroys the gonococcus, lessens the severity of the inflammation, and tends to prevent the development of complications, but does not possess the power of entirely stopping the discharge in all cases; so that, after the discharge subsides into a moisture and gonococci are no longer found, it would probably be better to substitute an astringent injection for the mercurol solution.

Charles E. Woodruff[1] contributes an article on the treatment of **gonorrhea** with frequent irrigations of **hot salt solution.** He says, from the trend of the literature on the subject, we should think ourselves unfortunate if our patients are not cured in 3 weeks. Vogl, however, finds that previous to 1882 the average duration of treatment in the military hospitals of Munich was 45 days; after the treatment by the silver salts was begun the average became from 45 to 47 days; and after 1896, when silver nitrate, permanganate of potash, and protargol were employed, the average was 42 days. The author is skeptical as to the value of the germicides used in the irrigation treatment; the organisms that are killed are those on the surface, which could be washed away just as well without producing any irritation of the mucous membrane by the use of germicides. The gonococcus will not grow at a temperature below 79° F., or above 100.4° F., and at a temperature of 113° F. its virulence and reproductive powers are destroyed. The microorganisms which are not washed away because of their deep position may be influenced by the temperature of the injections, but cannot be reached by antiseptics. It is irrational to secure a bland urine and then to spoil the effect by injecting irritating chemicals into the urethra. The disease is at first local, and only local treatment is indicated. The irrigations, consisting of a quart of salt solution, should be given every hour and should be as hot as the patient's comfort will allow. Of 98 cases thus treated, 30% lasted 7 days; 30%, 11 days; 20%, 17 days; 10%, 20 days; and 10%, over 3 weeks. In about 5% all symptoms disappeared in 2 days; in about

[1] Med. Rec., Mar. 16, 1901.

10%, in 3 or 4 days. After the discharge has ceased, an astringent injection is used for 2 or 3 weeks longer. Of the 98 cases there have not been more than 6 or 8 relapses. Early cases may be aborted, and the irrigations are not contraindicated in the acute stages.

In an article on the management of **gonorrhea,** B. Lapowski [1] says that although irrigation with potassium permanganate washes the gonococci from the surface of the mucous membrane, it is followed by a serous exudation, which is one of the best media for the growth of the organism. There are no proofs that protargol penetrates the deeper tissues, for when the treatment is discontinued the gonococci reappear, sometimes even after a period of 4 months. Excluding the genital organs, the gonococcus has been found in the circulating blood in 7 cases, in the endocardium in 7, in the pericardium in 2, in the pleura in 2, in the knee-joint in 7, in the tendon sheaths in 7, in the perichondrium in 1, in the marrow of the humerus in 1, in the peritoneum in 5, in 1 abscess in Douglas's pouch, in the spleen in 1, in 2 intramuscular abscesses, in the buccal cavity in 2, and in a nodule of erythema nodosum in 1 case. Negative microscopic examinations are sufficient to prove that a patient is cured. Forcible dilation may succeed in bringing the germs to the surface, but this is dangerous. Bacteriologic examinations may be regarded as adequate proof of cure, but even then there is a possibility of mistake. The only sure cure is not to contract the disease.

Plicque [2] states that in the **abortive treatment of gonorrhea** we should aim not to cause an immediate cessation of the discharge, but to remedy the condition by measures designed to produce a gradual subsidence of the inflammation, as the former method will produce lesions of the urethra which will later develop into strictures. Of the three methods mentioned—Neisser's, in which the newer salts of silver are utilized; Janet's, whereby the urethra is distended with a solution of permanganate of potassium, 1 : 4000 or 5000; and the procedure of Nogues and Hagge, the object of which is the irrigation of both the anterior and posterior portions of the canal, whether there be a posterior urethritis or not; the last plan is the best, as it cures 87% of those cases seen at the beginning of the disease. Solutions of permanganate of potassium in the strength of 1 : 10,000 are as efficient as the stronger solutions and are not so liable to be followed by irritation and discomfort. As soon as the organisms disappear from the pus irrigations should be stopped. Whereas invasion of the posterior urethra occurs early, and one can never be sure that it is not involved, the lavage should always be made to the entire canal. When the treatment is intrusted to the patient, a fountain syringe should be used. The first pint may be injected from an elevation of 2 feet and the second pint from a height of 3 feet. Two treatments daily are adequate. In propitious cases, after 5 or 6 injections the discharge diminishes, and all that can be seen is a clear drop which appears at the meatus. The irrigations are then decreased in frequency unless the symptoms relapse,

[1] N. Y. Med. Jour., Apr. 13, 1901. [2] La Presse Méd., Mar. 31, 1900.

which is liable to happen after alcohol or venery. The potassium permanganate should always be kept in solution, for if the dilutions be made from the crystals, one may enter the urethra and cause violent burning pain.

Kiss [1] calls attention to the importance of **mechanical antisepsis in the treatment of gonorrhea.** Large irrigations of water alone, repeated every 2 hours, will cause the almost entire disappearance of the gonococci and the discharge in 1 or 2 days. Discontinuance of this treatment is followed by the reappearance of the running, a phenomenon which is taken as proof that the irrigations are responsible for the cessation of the discharge. Of 12 cases, all were improved and 7 were watched for a sufficiently long time to determine the permanent absence of the microorganisms. Chemic antiseptics will enhance the action of the mechanical cleansing, and of these the best is permanganate of potassium. No treatment can be depended upon to prevent the appearance of complications, but they are more common in those cases not treated with medicated solutions. Of 1200 cases, 221 complications appeared before treatment was instituted and only 26 afterward.

L. Casper [2] treats **gonorrhea** by injecting 6 times daily a 0.10% solution of silver nitrate alternating with a 1% zinc sulphate solution; the strength of the silver solution is slowly increased to 9.25% and that of the zinc to 4%. As the discharge decreases the silver is displaced by permanganate of potassium 1 : 8000 or 10,000. Cure is usually established in from 4 to 5 weeks. In the chronic form of the disease a 1% to 2% silver nitrate solution is injected every 48 hours, alternating with irrigations of potassium permanganate gradually increased from 0.20% to 1%, and at the same time a daily injection of zinc sulphate (2%) is given.

C. Kopp [3] advises the **cleansing of the fossa navicularis** with a piece of cotton after a suspicious coitus and instilling a small quantity of a 2% silver nitrate solution or applying protargol-glycerin. The subsequent irritation lasts but a short time.

The modern treatment of gonorrhea, its complications, and sequels [4] was discussed at a meeting of the New York Academy of Medicine, March 21, 1901. G. K. Swinburne insisted on the early recognition of **acute gonorrhea** by the microscope. In a few cases coming under observation early he had made a diagnosis of nonspecific urethritis because gonococci were absent; later the germs were found in great numbers. One injection of protargol would cause their disappearance for several days. Gonorrhea is a self-limited disease, but, aided by improper treatment or loss of resistance on the patient's part, it may last for an indefinite period. First attacks respond to treatment more readily than do subsequent ones. Swinburne uses a solution of permanganate of potassium 1 : 4000 at a temperature of 105°, gradually increased to 120°. Protargol should be used in the strength of 0.5% to 2%, accord-

[1] Centralbl. für die Krankheiten der Harn und Sexual-Organe, Bd. XI, H. 7.
[2] La Semaine Méd., July 18, 1900. [3] Münch. med. Woch., Nov. 27, 1900.
[4] Med. Rec., Mar. 30, 1901.

ing to the effect on the patient. During the acute stage a mixture of cocain and protargol might be used. At first the injections should be given twice a day, then daily for a week, after which the intervals should be increased, until by the fourth or fifth week the treatments are only one per week. The patient is then allowed to indulge in alcoholic beverages to insure against a recrudescence. Local treatment is begun in any stage in which the patient presents himself. J. Van der Poel said that poorly nourished individuals with **chronic gonorrhea** would frequently be benefited more by tonics and fresh air than by local applications. Unnecessary instrumentation should be avoided. The endoscope should not be used until other methods have failed or until there is some special indication for it. Protargol is the best remedy for the destruction of the gonococci. In the presence of secondary infection solutions of bichlorid of mercury are useful, and when all germs have been overcome, weak astringent injections are employed. As a general rule, dilators are harmful when microorganisms are present. A 5% solution of silver nitrate or copper sulphate is applied to inflammatory patches. J. Pedersen discussed the **complications of posterior urethritis.** Cystitis is an infrequent complication.. Forcible irrigation is dangerous, as some of the fluid might be forced into the ureter. Ureteropyelitis is treated by fomentations and eliminatives; it generally ends in resolution. Inflammation of the spermatic cord is common; it is treated by elevation, ice, and evaporating lotions. Absolute rest may prevent an epididymitis. W. A. Holden asserted that the application of a 2% solution of silver nitrate or a 50% solution of protargol may abort an attack of **gonorrheal conjunctivitis.** J. R. Hayden thought the best treatment for recent **gonorrheal strictures** to be gradual dilation with irrigations. When near the meatus, cutting under cocain is often demanded. For obstinate strictures of the deep urethra external urethrotomy is the best operation. Electrolysis is condemned. R. W. Taylor believes it is better during the first week of an attack of urethritis to soak the penis in hot boric solution. Copious injections of permanganate do harm by their mechanical action. He thinks protargol would be less often used if silver nitrate were used properly. He has no fondness for "these bastard and emasculated preparations of silver." Bischoff said the **prophylaxis of gonorrhea** failed because it was entirely under police supervision and because medical supervision and treatment did not harmonize. Concerning personal prevention, Frank inoculated 6 males with gonorrhea and then injected into the urethras of 3 of the subjects a 20% solution of protargol in glycerin, with the result that they did not contract the disease, while those who were not injected did. Hill has found that in the chronic stage of urethritis, when shreds were found in the urine, **picric acid** 1 : 1000 or 1 : 2000 was useful when instilled in about 40-minim doses.

Follen Cabot, Jr.,[1] proposes for the treatment of **gonorrhea** in its incipient stage, during the first 24 or 36 hours, the introduction of a 10% solution of **argonin** into the anterior urethra by means of an

[1] Phila. Med. Jour., Jan. 26, 1901.

Ultzman's syringe. The solutions should be freshly prepared and introduced at a temperature of from 110° to 120° F. With the solution still in the canal an application of the same strength of argonin is made to the anterior 2 or 3 inches of the urethra by means of cotton on an applicator. The solution in the urethra is then allowed to run out and the procedure is repeated twice daily. If progress is favorable, the strength of the solution is increased and may be used as strong as 30%. After 2 or 3 days, in addition to the argonin, an astringent injection is ordered. In 30 cases thus treated, seven-eighths recovered in from 8 to 10 days, and in the others the duration was not shortened, but no complications arose.

In an editorial discussion of the **sequels of gonorrhea,** "American Medicine" [1] mentions a paper by König [2] in which it is stated that the gonococcus may be found in every cavity and organ of the body. König divides the sequels into three classes: local, as stricture, etc.; ascending, as ovaritis, cystitis, pyonephrosis, etc.; and the blood infections which give rise to pyemia, affections of the heart, pleura, and joints. He narrated 2 cases of severe pyonephrosis, one of which required nephrectomy. During the past 5 years 18 cases of gonorrheal arthritis of the hip have come under his notice, one patient dying as the result of a pyelitis. Only 6 patients were permanently cured; in the others there was limitation of motion, and in 4 permanent shortening. Cases similar to these are frequently not recognized, the condition being mistaken for tuberculosis. Attention is invited to the importance of establishing series of lectures by prominent medical men for the education of the public as to the dangers of this common disease. This has been done in Berlin under the direction of the Royal Bureau of Public Instruction.

Although the extension of **gonorrheal infection** [3] by continuity has long been recognized, it is only recently that the possibility and gravity of general infection by this organism has been appreciated. Arthritis, endocarditis, and myelitis are among the most familiar of these complications. Ward [4] points out the fact that the constitutional symptoms of gonorrhea are due to the absorption of the gonotoxin, and that it is probable that spreading of the infection is favored by the paralyzing effect of the toxin on the leukocytes, which hinders the destruction of the microbes. General infection is thought to be aided by the harsh measures directed toward the local condition, by lowering the resistance and opening an atrium for the organism. Violent antiseptics, forcible irrigation, and instrumentation should be avoided, especially during the acute stage of the disease. General infection is to be treated by the administration of eliminatives and internal antiseptics, as quinin, mercury, arsenic, and the salicylates.

Prince A. Morrow [5] stated to the New York Medical Society, February 25, 1901, that it has been estimated that one-eighth of all the patients in the hospitals suffer from **venereal disease** or its con-

[1] Apr. 6, 1901. [2] Berlin. klin. Woch., Nov. 19, 1901.
[3] Editorial, Med. Rec., May 18, 1901. [4] Brit. Med. Jour., Mar. 30, 1901.
[5] Med. News, Mar. 23, 1901.

sequences. Neisser says **gonorrhea** is the most prevalent contagious disease, excepting measles, and that in some European cities more than three-fourths of the population have had the disease. Fournier believes one-seventh of Paris to be **syphilitic.** Seventy per cent. of the syphilis in women at the New York Hospital is due to conjugal infection. Morrow has seen more than 50 cases of syphilis insontium in medical men. Sixty to 80 % of stillborn children are due to syphilis; rickets is almost exclusively of syphilitic origin. Syphilis is twenty times more contagious than tuberculosis, and almost as severe in its ravages. In British India about 53.7 % of invalided soldiers suffered from venereal disease, and 30 % of these from syphilis. Attention was called to the fatal complications of gonorrhea, of the gynecologic troubles that follow it, and to the enormous number—20 %—of the blind who owe their trouble to the disease. Neisser claims that there are in Germany 30,000 blind persons because of gonorrhea. Twenty per cent. of sterile marriages are due to gonorrhea. If regulation of prostitution is to be carried out, the men as well as the women should be submitted to examination, but legal supervision would provoke vice as the fear of disease would be lessened. Every hospital should provide free beds for the treatment of venereal diseases; facilities at present are miserably inadequate. All sources of infection should be eliminated as far as possible. Chancres should be excised, mucous patches cauterized with acid nitrate of mercury, and the patients carefully instructed as to the possibilities of contagion, a printed slip being given them on which are rules regarding towels, pipes, etc. Medical men must be of the opinion that continence is compatible with health, that harlotry is no substitute for marriage, and that self-restraint is a valuable measure for the preservation of health.

Servel [1] believes **gonorrheal myositis** to be more frequent than has hitherto been supposed. Twenty-one days after an infection is the average time for this painful condition of the muscles to appear. The tenderness may be slight and subside in a short time or the pain may be violent and associated with swelling of the part and fever. Edema and swelling of the lymph-glands are rare. The condition is more common in men than in women, and often follows muscular effort. Permanent changes in the muscles do not occur, and the muscle affected soon becomes normal under antiphlogistic treatment.

M. Krotoszyner [2] read before the San Francisco County Medical Society, December 11, 1900, a paper on the **rarer complications of gonorrhea.** He referred to the ravages of the disease in the upper genitourinary apparatus of both the male and female, but called particular attention to the **nervous** complications. In the French Hospital at least 60 % to 70 % of the patients suffer from sexual neurasthenia. Of the organic affections, three classes seem to prevail the most: neuralgias, especially sciatica, muscular atrophies and atrophic paresis, and gonorrheal neuritis and myelitis. He reported a case of gonorrheal sciatica and a case of urethritis complicated with a peculiar affection

[1] Thèse de Bordeaux, 1900. [2] Jour. Am. Med. Assoc., Jan. 26, 1901.

of the nails. He has been able to establish organic degeneration in the spinal cords of animals inoculated with the gonotoxin, which produces symptoms similar to tabes. It seems probable that gonorrhea is really a constitutional disease whose toxin invades and permeates all portions of the body, and that it may produce as manifold and serious complications as those observed in syphilis.

Ludwig Weiss [1] maintains that a patient may be permitted to **marry after gonorrhea** when, after repeated and exhaustive microscopic and bacteriologic tests, no gonococci can be found. He believes the views of Behrend, who maintains that the finding of gonococci when clinical symptoms are present is superfluous, and that when symptoms are absent the investigations for the microbe are unreliable, and those of Kromayer, who asserts that even after repeated examinations have failed to demonstrate the presence of the germ the physician has no right to permit his patient to marry, to be untenable. Behrend holds that gonorrhea in the female is not curable, and Neisser claims that gonococci may be found in the female genitals even in the absence of symptoms and microscopic signs. The author believes it to be curable. If the physician fails to find the organism on the shreds of a person who has had gonorrhea and who wishes to marry, the patient should not be told that he is cured, but an injection of a 2% silver nitrate solution should be given and the resulting discharge examined by the cultural method, which will demonstrate positively the presence or absence of the gonococci. The centrifuge should be used to collect the shreds in the urine.

Krulle [2] argues that extensive extirpation of the inguinal glands for **bubo** frequently causes a permanent swelling of the limb and really consumes more time than the conservative treatment which he advocates. Each gland is punctured and the pus expressed through the resulting minute incision; it is then washed out with sterile water and a 1% solution of silver nitrate injected. This procedure is repeated every two or three days until the gland has healed.

S. G. Dabney [3] reported to the Louisville Medico-Chirurgical Society, February 1, 1901, a case of **chancre of the tonsil** contracted through smoking an infected pipe. It was about the size of a 5-cent piece, situated between the right tonsil and the posterior palatine fold, and was followed by typical secondary symptoms. T. C. Evans stated that he had seen 3 chancres of the tonsil; one communicated the disease to a relative by kissing, a chancre of the lip resulting. J. M. Ray and W. Cheatham each spoke of having seen the condition, the former mentioning 3 cases and the latter 1 case.

Young [4] has successfully cultivated the gonococcus from cases of arthritis, subcutaneous abscess, cystitis, pyonephrosis, and peritonitis. He recommends sterilized hydrocele serum mixed with the usual nutrient agar as the best culture medium.

[1] Med. Rec., Mar. 23, 1901. [2] Berlin. klin. Woch., Nov. 12, 1900.
[3] Am. Pract. and News, Mar. 15, 1901.
[4] Jour. Cutan. and Gen.-Urin. Dis., June, 1900.

In a lecture on **syphilitic diseases of the tongue,** Christopher Heath [1] states chancre of the tongue to be very rare, as he has never seen a case. When it does occur, it, like chancre of the lip and of the finger, does not present that remarkable hardness characteristic of the initial lesion of the genitals. Mucous patches and "bald patches" which are due to the cicatrix of a superficial inflammation of the tongue and fissures of the tongue were discussed under the secondary affections. Unilateral thickening of the tongue and ulcerations, some of which may even split the organ down the middle, may occur. Under gummas of the tongue Heath called attention to those cases which resemble epithelioma, but which recover under syphilitic treatment. He reported a case of gummas not relieved by vigorous antispecific measures, in which amputation of the tongue was performed and an epitheliomatous condition found in connection with the gummas. Leukoplakia is always accompanied by irritation, and is frequently, but not always, syphilitic. Lingual warts are seen in the syphilitic, but are not to be confused with the hypertrophied papillas which occur in those who are free from this disease.

W. J. Collins [2] reports a case of **chancre of the lip rebellious to mercury.** The patient was a girl aged 19 years, with an infiltrated ulceration on the upper lip, which slowly extended despite the administration of full doses of mercury. Ulceration of the left tonsil and palate appeared. There were no skin eruption and no constitutional symptoms except slight fever. Recovery occurred after the administration of large doses of potassium iodid.

Zydlovitz [3] advocates the use of the **actual cautery for the treatment of chancroid.** After anesthetizing the part with a 2% cocain solution, the cautery is held about 3 millimeters from the sore; this destroys the infection and the treatment resolves itself into the care of a simple ulceration. Careful cleansing before the application of the cautery enhances the result.

M. W. Herman [4] states that silk **catheters** may be made absolutely **sterile** by boiling them in a solution of ammonium sulphate, similar to the Elsberg procedure for the sterilization of catgut, without unfavorably affecting them in any way.

J. R. Eastman [5] describes a **shielded piston syringe for urethral and vesical irrigation.** "It consists of a 5-ounce metallic piston syringe with detachable blunt nozles. A thin-spun metal shield surrounds the barrel. The shield is made movable, in order that it may be held up while the nozle is introduced into a graduate or other vessel for filling. The syringe being filled, the shield is pushed down along the barrel and fastened by a slot-and-pin catch about an inch behind the tip of the nozle." It is designed to overcome the objections of the various apparatus that are used to irrigate the urethra under pressure. These apparatus are on the fountain syringe principle, are hard to ster-

[1] Brit. Med. Jour., Dec. 22, 1900.
[2] Lancet, Jan. 5, 1901.
[3] Gazeta Lekarska, Dec. 16, 1900.
[4] Centralbl. f. Chir., Jan. 19, 1901.
[5] N. Y. Med. Jour., Apr. 13, 1901.

ilize, may cause the introduction into the urethra of crystals of permanganate of potassium which have settled to the bottom of the reservoir, are difficult to control accurately concerning the instant shutting off of the current and adjusting the pressure, and consume a large amount of time in their manipulation.

DISEASES OF THE BRAIN AND NERVOUS SYSTEM.

In an address before the Otological Society of the United Kingdom, at Edinburgh, Charles A. Balance [1] deals with the **operative treatment of abscess of the brain.** It is thought important to determine as soon as possible the nature of the microorganism producing the abscess. After reviewing the various details of the preparation of the patient, he recommends very strongly a large opening in the skull after turning down a large scalp flap. For draining an abscess in the temporosphenoidal lobe the trephine should be applied $\frac{7}{8}$ inch above the suprameatal spine. In operating for a cerebellar abscess the trephine should be placed so that its upper edge is just below Reid's base line and its anterior edge touching the posterior border of the mastoid process. When the dura mater is opened, the incision should be made so as to form a flap. This will be found more convenient than a crucial incision. Balance recommends a long, narrow, straight bistoury for the purpose of exploring for abscess, since the wound made by such an instrument heals better than does the punctured wound produced by the exploring needle or cannula. [This use of a bistoury we should consider dangerous, since much more hemorrhage must follow than when the grooved director or blunt trocar and cannula is employed.] Irrigation of an abscess-cavity in the brain should only be employed when there is free exit for the fluid, and this can best be established by means of a tube. The method of tamponing these abscess-cavities with gauze does not meet with the approval of the author. Not infrequently the symptoms will recur a few days after the opening of a brain abscess, and these are indicative of a reaccumulation of fluid, or perhaps the formation of an entirely new abscess at another point in the same lobe. This fact is particularly true of pus formations in the cerebellum.

Clarke and Morton [2] record a case of **abscess** situated **in the left lateral lobe of the cerebellum** which was successfully evacuated. The patient was a child 13 years of age, who had suffered from nasal catarrh followed by a discharge from the left ear 4 months previous to admission. The patient presented at the time of admission a subnormal temperature, optic neuritis, slow cerebration, headache, convulsions, and constant vomiting. There were present also marked paresis and tremor of the left arm. The eyes were directed to the right side, and there was a tendency to fall to the right. The headache was more marked upon the right side, and the optic neuritis was more intense on this side. Morton explored the cerebellum after the method of Dean. About 2 ounces of pus was evacuated when the cannula was thrust forward, inward, and

[1] Lancet, May 25, 1901. [2] Bristol Med.-Chir. Jour., June, 1901.

downward. The abscess-cavity was drained by means of a rubber tube. The patient made a satisfactory recovery. The drainage tube was removed at the end of 5 weeks, and a week later the patient went to her home. An otorrhea was present at the time of the operation and when she left the hospital, but a short time afterward it ceased and has not returned. Morton commends highly Dean's method for exploring for abscess, since through the same trephine opening, situated immediately over the lateral sinus, exploration can be made of both the cerebellum and the temporosphenoidal lobe. He always trephines at a point 1½ inches behind and ¾ inch above the center of the meatus. The exploration of the cerebellum and of the temporosphenoidal lobe through the same opening is a great convenience and saves considerable time. It is thought that in many cases the abscess has not been found because the patient's condition would not permit another trephine opening with further exploration. Morton employs a blunt trocar and cannula. This instrument is considered to be much safer than the exploring needle, since it is not apt to penetrate any large vessel. The case reported, in which the pus was not found until after 5 punctures had been made, shows the importance of prolonging the search in cases of supposed brain abscess.

E. W. Mitchell [1] presented a case of **cerebral abscess** at the Cincinnati Academy of Medicine. The patient was a boy 13 years of age, who 3 years previously had suffered from a fracture of the right frontal bone, for which condition he was trephined and made an uneventful recovery. Three days before admission he began to complain of headache and pain at the root of the nose. Later he became unconscious, and his temperature rose to 103°. The pulse was full and strong, the pupils were slightly contracted, but reacted normally to light. The patient could be aroused slightly, but would again relapse into a stuporous condition. After two convulsions there developed a slight squint of the left eye. Slight opisthotonos was noticed on the third day. A diagnosis of meningitis was made, but before the boy could be operated upon a severe convulsion occurred in which he died. A postmortem examination of the brain showed the pia over the right frontal and anterior half of the parietal lobes to be covered by greenish-yellow lymph. There was a small abscess about 1 inch below the surface of the superior frontal lobe. The abscess seemed to have a lining membrane. The tissue between the abscess and the surface was much softened. Mitchell thinks that this abscess formed at the time of the injury 3 years before and had become encysted.

Dieulafoy [2] asserts that almost without exception **abscess of the cerebellum** is the result of an **otitis media.** The most reliable symptoms of this condition are occipital headache, vertigo, staggering gait, vomiting, nystagmus, optic neuritis, contraction of the cervical muscles, muscular asthenia, and a condition of somnolence bordering on coma. The affected lobe can be localized if there is a paralysis of the external oculomotor nerve. Where the abscess is situated in the tem-

[1] Jour. Am. Med. Assoc., Apr. 20, 1901. [2] Le Progrès Méd., June 30, 1900.

porosphenoidal or occipital lobes of the cerebrum there will be motor affections such as paresis, spasms, aphasia, hemianopsia, etc. In all cases of supposed brain tumor a history of syphilis should be carefully sought.

A case of **temporosphenoidal abscess following middle ear suppuration** with recovery after operation is reported by Jakins.[1] The patient was a man who had suffered from middle ear disease for 2 years. At the time of admission the meatal canal was found full of offensive pus, and there was considerable bulging of the superior and posterior meatal walls. The patient complained of a great deal of pain over the right side of the head, and there was a tenderness on pressure over the right mastoid region. He was disturbed by giddiness and nausea. The breath was foul and the lips and teeth covered with sordes. On the day after admission the mastoid antrum was opened and found to contain granulation tissues and cholesteatoma. In removing the diseased tissue a communication with the middle fossa was discovered. A portion of the bone over this region was removed by the trephine, but as there was no bulging of the dura mater, an exploration of the cerebrum was not made. The patient was greatly relieved after the operation, but after three days complained of great pain, was very restless, and later fell into a comatose condition. A palsy of the left leg and arm developed. The former trephine opening was again exposed, the dura mater was found to bulge and was divided. When a grooved director was passed into the temporosphenoidal lobe a large amount of foul-smelling pus was evacuated. The cavity was drained and the patient made a good recovery. The palsy of the arm and leg promptly disappeared after the operation. It is thought by Jakins that the presence of a polyp or granulation tissue in the external canal is indicative of trouble in the antrum or attic, or both, and that any operation performed through the external meatus is of no advantage. Within 2 years he has operated upon 4 cases of cerebral abscess the result of middle ear disease.

Clarke and Lansdown[2] report a case of **sarcoma of the brain** in which there was a marked absence of all localizing symptoms. The only symptoms which indicated the side of the brain affected were an increased dullness on percussion over the left parietooccipital region and a palsy of the left external rectus muscle. Optic neuritis was more marked on the left side. The other symptoms were those usually found in cases of brain tumor. The patient was trephined over the dull area and a growth distinctly encapsulated, measuring $1\frac{3}{4} \times 1\frac{1}{4} \times \frac{1}{2}$, was removed. The cavity left by the removal of the growth immediately filled with what appeared to be normal brain tissue. No palsy followed the operation and the patient temporarily improved. After a few weeks all the symptoms returned. The skull was again opened in the same position and a large tumor was found protruding through the opening in the skull, and no healthy brain tissue was visible. The growth was dense and was easily separated from the surrounding brain substance. The

[1] Lancet, Mar. 30, 1901.

[2] Brit. Med. Jour., Apr. 13, 1901.

mass weighed 6½ ounces and was the size of a large orange. The examination of this growth and of the former one showed that each was a spindle-celled sarcoma. Some palsy followed this operation, but gradually disappeared. Eight months after the operation there was no evidence of any recurrence and the patient had recovered all of his lost faculties. Vision, however, improved very little.

A. Pitres [1] reports a case of **tumor of the right crus cerebri** occurring in a woman 35 years of age. The patient suffered from headache 2 years; during the second year it was constant. For 3 months the pain was so severe that the patient was unable to do any work. A short time before admission failing sight was discovered, with some palsy of the left side of the face and left arm. Upon admission the patient suffered from constant headache, which was worse at night, causing the hydrocephalic cry of meningitis. Bilateral optic neuritis, partial paralysis of the third cranial nerve on the right side, dilation of the right pupil and paralysis of the superior rectus, and a slight paresis of the muscles of the lower half of the left side of the face and the left arm were considered positive signs of a peduncular lesion. The patient died of an apoplexy just before the preparations for an operation were completed. An autopsy showed a glioma in the right crus cerebri just at the point of entrance into the right hemisphere. Sudden death is very apt to occur in these cases.

At the Congress of the Italian Surgical Society, Roncali [2] reported a case of **tumor situated in the right post-Rolandic region,** which was of dural origin, and which upon examination proved to be a fibrosarcoma. The growth was interesting because of its parasitic contents. Roncali considered that the case corroborated the theory of the blastomycetic origin of malignant tumors and destroyed the hypothesis of secondary blastomycetic infection. The following statements were made by the author: "(1) The blastomycetes are not and cannot be accidental in malignant tumors. This he demonstrated by referring to the experiments made by him, and the conditions observed in the tumor in question. (2) The failure to find the parasites in a tumor does not mean that they do not exist or that those which are there are degenerations, inasmuch as when the parasites assume the character of Russell's bodies they cannot be cultivated, as Sanfelice has recently shown. (3) The parasites can always be found in malignant tumors, provided one knows how to recognize them and has the patience to search for them. This has been proved by the author's researches, and by those recently made by Plimmer. (4) The coccidia which have been described in the tissues of cancer and of sarcoma are nothing but blastomycetes, as the author has maintained since 1895; this has recently been confirmed by Podwissoski. (5) The blastomycetes are the real etiologic factors of epithelioma and of sarcoma, as the author on the basis of his histologic researches and of the clinical course of these neoplasms had maintained since 1895, and which he considered had been demonstrated by the

[1] Jour. de Méd. de Bordeaux, Jan. 13, 1901, No. 2.
[2] Brit. Med. Jour., Nov. 17, 1900.

experimental work of Sanfelice at first, and then by that of Plimmer, Bra, and Leopold."

Hoppe [1] reports 7 operations for **brain tumors and cysts.** He says that the reason operations for brain tumor have fallen into such ill repute is the fact that so many operations have been performed before sufficient pains have been taken to locate the exact situation of the growth. It is urged that operation for this condition should be performed as early as possible. When we consider that all cases of brain tumor are necessarily fatal, we should not hesitate to urge surgical interference. Even the benign tumors are fatal, since they ultimately destroy the mental as well as the physical life of the patient. Improvement in the treatment of these growths must come from the neurologist, who needs to perfect his methods of diagnosis so that the surgeon may operate at an early period of the disease. Attention is called to the great difference in the mortality-rate of those operations in which the growth has been definitely localized and those in which its situation is uncertain. The 7 cases reported were under Hoppe's care, but were operated upon by several different surgeons. After a discussion of these cases the following conclusions are reached: (1) Common tumors of the cortex or subcortical region which are accessible through the skull should be operated upon. (2) If possible, the operation should be performed when the growth is small. (3) Cerebral surgery is limited to the psychomotor areas. (4) Complete recovery is not usual after operation for cerebral tumor, the focal symptoms and pain are relieved, but epilepsy and paralysis may be only slightly diminished. (5) Because of the difficulty of localizing cerebellar growths and the small field for operation in this region, such growths are usually inoperable. (6) The weight of opinion of all writers is against exploratory operation. (7) Regarding the advisability of palliative operations, the profession is divided. (8) Gummas, when accurately located, can be operated upon with success. Hoppe calls attention to the fact that although a complete recovery does not follow the removal of brain tumors, the life of the patient has been saved, since the growth left alone will inevitably prove fatal. Metastatic growths are inoperable.

The **value of the ophthalmoscope in brain surgery** is dealt with at some length in a paper by Pischel.[2]

Montini [3] reports a case of **hydrocephalus** in which he instituted drainage with considerable success. The child was 3 years of age and showed all the mental and physical signs of hydrocephalus. Three hundred and fifty grams of fluid was evacuated from the ventricle. Cerebral fluid continued to drain for 7 days. A year after the operation the child shows considerable improvement. The squint was less marked and there had been no convulsions for several months.

Kirmisson and Kuss [4] report a case of **congenital meningocele** of the occipital region in which recovery followed operation. The patient was 6 weeks old, and, excepting the meningocele, was well developed

[1] Jour. Am. Med. Assoc., Feb. 2, 1901.
[2] Pacific Med. Jour., July, 1900.
[3] Gaz. degli Osped., Aug. 12, 1900.
[4] Rev. d'Orthop., Sept., 1900.

in every respect. Considerable bleeding attended the operation, but the patient made a speedy recovery. Six months after the operation the child was quite well. The pedicle was small and was ligated with catgut. The cyst was found to consist of two zones, an external one of fibrocutaneous structures and an internal one consisting of a portion of the choroid plexus and a mass of neuroglia arranged in distinct layers.

Gamgee [1] reports 2 cases of **cranial meningocele** and says that the successful surgical treatment of this condition depends largely upon asepsis and the general condition of the child, because the most frequent causes of death are septic meningitis and shock. The first case was a child 6 weeks of age. The tumor was situated at the back of the head and the skin overlying it was normal in appearance. It was translucent, partly reducible, and became more tense when the child cried. When the skin was removed from the tumor, it was found to have a very small pedicle, which was ligated with silk. The wound healed primarily and 4 months after the operation the child was in good condition. The second case was a child 11 weeks old. The growth occupied the same position as in the former case and resembled it in every particular. The pedicle, however, of this tumor was too broad to be included in one ligature, so the opening was closed with a continuous suture. This patient also made a satisfactory recovery. Unfortunately, many of these patients are in no condition to stand the shock of an operation. The operation itself, however, is not a difficult one excepting where the pedicle is very broad.

Carl Beck [2] discusses the question of **hydrencephalocele** and reports 2 cases. The first patient was a boy 5 weeks of age. The tumor was about the size of an orange, projecting from the nasofrontal region, and did not pulsate. The skin over the tumor appeared normal. The contents could be almost entirely pressed within the skull, which procedure did not cause any reaction. The growth was thought to be a meningocele until a skiagram showed that there was a solid mass within the tumor. This was taken to be cerebral substance. The skiagram showed a space between the nasal and frontal bones the width of a man's thumb. Because of the character of the tumor excision was decided upon. When the growth was opened, it was found to contain degenerated cerebral tissue surrounded by dura mater. Two-thirds of the sac was removed and the remaining third freed from the frontal bone together with the periosteum and then united with catgut. There was no reaction after the operation and the wound healed promptly. A skiagram taken 1 week after the operation showed the opening in the skull to be somewhat smaller. Six weeks after the operation considerable narrowing of the opening had taken place and the child at this time was normal in every respect. The second case was a boy 7 weeks of age. The tumor in this case projected from the foramen magnum and exceeded the size of the child's head. A portion of this tumor fluctuated, while the remaining portion was solid. The

[1] Lancet, Sept. 15, 1900. [2] Jour. Am. Med. Assoc., Dec. 22, 1900.

skull appeared microcephalic. The child could not cry, but only moaned. Ophthalmoscopic examination was unsatisfactory and the restlessness of the child also prevented the making of a satisfactory skiagram. Operation was declined at first and was not acceded to until the child was in an alarming condition from convulsions. Death at this time appeared imminent from spontaneous rupture. Considering the absolute hopelessness of the case if left alone, immediate excision was determined upon. Before the operation was attempted, however, it was shown that constriction of the base of the tumor with a rubber band produced no dangerous effects. The tumor was found to contain cerebrospinal fluid and normal brain substance. The child died on the fourth day from purulent meningitis. No autopsy was allowed. Beck refers to another case in which a smaller growth situated at the superior angle of the occiput disappeared after continuous pressure by iodoform gauze collodion.

Richardson,[1] in discussing the **cerebral complications of middle ear disease,** reports a number of interesting cases. The first is one of sinus thrombosis in a man 60 years of age. The mastoid antrum was badly diseased and filled with offensive pus. The sinus was exposed, opened, and found to be filled with broken-down blood clot, which was removed until the circulation was restored from above. An incision was made in the neck, the jugular vein ligated and removed. It was collapsed and contained some organized blood clot. The patient died of sepsis 26 hours after operation. The second case was one of sinus thrombosis occurring in a man 25 years of age. In this case the mastoid antrum was opened prior to the operation upon the sinus. This operation gave great relief for a number of days. In about 2 weeks, however, the patient's temperature rose and pus was found dissecting its way underneath the temporal muscle. When this pus was liberated, a carious perforation of the outer table of the skull was found. Further exploration discovered an extensive osteomyelitis, the probe passing readily between the outer and inner tables of the skull for some distance. A large portion of the outer table was removed. The patient improved for 4 or 5 days, when his temperature again rose, this time due to a collection of pus in the occipital region, which was evacuated. This was followed by improvement, but about a week later symptoms of sinus thrombosis appeared. The sinus was exposed and found to be filled with broken-down clot. A return circulation was obtained from below, but none could be obtained in the other direction, although exploration was carried as far back as the torcular. The patient subsequently died from extension of the infection and no autopsy could be obtained. The third case was one of cerebral abscess resulting from a suppurating ear in a man 63 years of age. The mastoid cells in this case were not involved. An exploration of the temporosphenoidal lobe was made, but no abscess discovered. The patient died and an autopsy revealed a small abscess about the size of a hickory nut on the mesial side of the uncinate convolution. It is thought that in exploring for this

[1] Jour. Am. Med. Assoc., Feb. 23, 1901.

abscess the probe passed through it and that the pus was too thick to flow. In cases of sigmoid thrombosis operation should be instituted as soon as a diagnosis is made. Richardson urges upon the general practitioner the careful consideration of the symptoms indicative of sinus thrombosis in cases of middle ear disease. A chill, high temperature, and a sweat are symptoms of extreme gravity, and should suggest to the medical attendant an involvement of the sinus. The author thinks that ligation of the jugular vein should be done even though a return circulation may be obtained through the opening in the sinus. One of the early symptoms of cerebral abscess is an alteration in the demeanor of the patient, such as irritability, moroseness, and attacks of semihysteria. When to these symptoms is added some form of aphasia, the diagnosis of cerebral abscess is quite probable.

Waterhouse [1] reports an interesting case of **sinus thrombosis** and **cerebellar abscess** resulting from middle ear disease. The patient had suffered from a purulent discharge from both ears for the greater part of his life. In 1895 Waterhouse had operated upon him for a large supramastoid abscess in the right side. The patient also had tubercular abscesses of the hip. On admission he presented many of the symptoms of sinus thrombosis. It was, however, impossible to locate definitely the side upon which the thrombosis had occurred. There was no pupillary change and no optic neuritis. The patient suffered from rigors and very high temperature. It was finally determined to operate upon the left side. The internal jugular vein was tied and the sinus cleared of a septic thrombus. The patient recovered promptly, but several days after the operation streptococci were found in the blood. Ten days later the patient complained of headache, the pulse fell to 56, and vomiting occurred. Two days later the patient was comatose, and double optic neuritis, Cheyne-Stokes respiration, and a pulse of only 50 were noted. Abscess was suspected and an exploration of the temporosphenoidal lobe on the left side was made. Respiration ceased entirely under even partial anesthesia. An exploration of the temporosphenoidal lobe was made with negative results. The patient's pulse at this time was imperceptible and his condition seemed desperate. The exploring needle was thrust through the tentorium into the cerebellum from above and immediately an ounce of fetid pus was evacuated and the respiration and pulse recovered at the same instant. An opening was then made in the occipital region with the trephine and several drams of pus was evacuated. The patient recovered satisfactorily, though for some time word-deafness was present. This case illustrates the great difficulty experienced in locating intracranial abscesses. In this case the absence of pain and tenderness in the region of the jugular vein made the diagnosis particularly difficult.

Firth [2] presents a paper on the **ligation of the jugular vein in the treatment of sigmoid-sinus thrombosis** and expresses the opinion that it is not necessary in many cases to ligate the vein. He thinks

[1] Lancet, Mar. 30, 1901.

[2] Med. Rec., May 11, 1901.

that it is sufficient if a free flow of blood can be had from both directions by removing the infected thrombus.

J. Shelton Horsley [1] writes upon **epidural hemorrhage without fracture of the skull.** Although epidural hemorrhage may occur from the sinuses of the dura mater and from the vessels of the diploe, yet its most frequent source is from the middle meningeal artery. The most serious danger from epidural hemorrhage is compression of the brain. The pathognomonic symptom is an interval of consciousness between the time of injury and the first cerebral symptom, but frequently this interval is not present. The pupil on the side of the hemorrhage is usually dilated. The pressure of the clot as it increases produces paralysis upon the opposite side. Epidural hemorrhage at a distance from the motor centers or tracts cannot cause convulsions or paralysis until it has produced a general compression. Cases of epidural hemorrhage should be operated upon as soon as possible. Horsley records a case of a man 21 years of age who was struck on the head with a wooden club. One and a half hours after the injury he became drowsy and within a few hours fell into a stupor. There was a small contusion over the left parietal eminence. The pupils were equal; the right side of the body and face were paralyzed and the left arm and leg were constantly jerking. The control of the bladder and rectum was lost. The skull was opened in the left parietal region and a large blood clot, estimated as from 4 to 6 ounces, was removed. The clot extended over an area measuring about 4 inches in diameter. Only slight bleeding occurred after the removal of the clot. Iodoform packing was introduced and the patient made a satisfactory and rapid recovery. No fracture of the skull was found.

Hamilton [2] reports a successful trephining for **rupture of the middle meningeal artery** in a boy 8 years of age. The patient did not develop symptoms of compression until the day following the injury. There was marked dilation and fixation of the left pupil.

Ramsay [3] reports an interesting case of **subdural hemorrhage with convulsions.** The patient was a man 54 years of age, who was found in a comatose condition on a country road with his horse standing beside him. Shortly afterward he roused somewhat and was much excited in speech and manner. The next night the patient was very noisy and restless and recognized no one. Forty-two hours after the injury he was admitted to the hospital. At this time he would not answer questions and did not seem to realize his surroundings. There was no paralysis of face or limbs. There was a small bruise on the scalp in the left occipital region; no skull injury was found. After the administration of morphia the patient slept and during his sleep his right arm and hand began to twitch and later twitching of both arms was noticed. The next day the twitching extended to the lower limbs and the left side of the face. At this time a general convulsion occurred and seven others followed

[1] N. Y. Med. Jour., Feb. 9, 1901. [2] Liverpool Med.-Chir. Jour., Mar., 1901.
[3] Inter. Med. Jour. of Australia, Oct. 20, 1900.

quickly. During the convulsions the left side of the body seemed most involved. Breathing became of the Cheyne-Stokes character. Venesection was now resorted to, but without benefit. The patient was anesthetized and the motor area upon the right side of the brain was exposed. A large flat clot was found beneath the dura, extending over a large area. This was removed and a gauze drain inserted. Within an hour after the operation two convulsions occurred, but after this there were no more. For a fortnight the patient was either very restless or else in a drowsy condition, with Cheyne-Stokes respiration. He made a satisfactory recovery, however, except that there was some impairment of memory. The case is interesting from a diagnostic point of view, since it was difficult to tell how much the patient's symptoms depended upon alcoholism and how much upon the injury.

Proudfoot and Farmer [1] report a case of severe **subcranial hemorrhage** which recovered after trephining. The moment the button of bone was removed a large clot bulged into the wound and the breathing, which had before been stertorous in character, became normal.

Kiliani [2] reports a case of **large traumatic subdural hematoma with 21 days "free interval."** The patient was struck upon the head by a brick, but no surface wound was inflicted, and the patient continued at his work, although dazed for a short time. Fifteen days after his injury there was some difficulty in handling his cup of coffee. Three days later he developed a violent frontal headache, and 21 days after the injury, while walking, he became dizzy and almost fell. A week later slight hesitancy in speech developed. Upon admission the patient was somewhat somnolent and there was slight spastic paralysis of the right arm and hand and right leg; there was no facial paralysis. There was a partial motor aphasia. Percussion over the left temporal region gave a lower pitched sound than over the right, and produced pain. The eye-ground showed nothing abnormal. A large osteoplastic flap was turned down on the right side. The dura was found tense and nonpulsating. When it was divided, a large blood clot was discovered which covered practically the entire left hemisphere. This clot was removed and drainage introduced. The spastic condition of the right extremity disappeared while the patient was still on the operating table, and 4 hours after the operation he spoke coherently, could read well, and the motions of the right arm were perfect. Ten weeks after the operation the patient was perfectly well and attending to his business. [This paper was read at the New York Surgical Society and the subject discussed by Brewer, Dawbarn, and Kammerer, all of whom had had experience with subdural hemorrhage.]

Renton [3] presents the notes of 2 cases of **excision of the Gasserian ganglion for epileptiform neuralgia.** Both patients were well advanced in years and both made satisfactory recoveries. The method of Hartley and Krause was employed in both instances.

Bartlett [4] reports 2 successful cases of removal of Gasserian gan-

[1] Brit. Med. Jour., Nov. 17, 1900.
[2] Ann. of Surg., Mar., 1901.
[3] Brit. Med. Jour., Nov. 17, 1900.
[4] Ann. of Surg., June, 1901.

glion for **trifacial neuralgia.** The ganglion was removed intact in each case. The peripheral procedures for tic douloureux have proved of very doubtful benefit. Section of the sensory root, as proposed by Horsley, is scarcely less dangerous than ganglionectomy, and the posterior root regenerates from the ganglion, so that we have but one course to pursue in these operations, which is to remove the ganglion. Involvement of more than one branch of the fifth nerve, the presence of pain in an area which receives its nerve near the latter's point of exit from the skull, paroxysms which are not the expression of constitutional or cerebral disease, and the failure of all other therapeutic measures are indications for the removal of the ganglion. Bartlett's cases were operated upon by the Cushing method. The first patient was 60 years of age and had suffered for 17 years. All the teeth on the affected side had been extracted and the infraorbital nerve removed. For 4 weeks after the operation there was complete paralysis of the muscles innervated by the third, fourth, and sixth nerves. This disappeared in the course of 3 weeks and a small ulcer of the cornea appeared, which finally healed. The second case was a woman aged 50, who for many years had been a victim of toothache on the right side. All the branches of the nerve were affected. Motor derangement of the eye was identical with that observed in the first patient, but the cornea remained intact. He quotes Tiffany, who says that "recurrence after a known removal has not been reported." Of 95 intracranial operations on the trigeminus, according to Marchant and Herbert, in but 15 was the ganglion completely excised. Of 100 recent extirpations, according to Carson, but 11 resulted in death.

Victor Horsley,[1] in an address on the **surgical treatment of trigeminal neuralgia,** delivered before the North London Medico-Chirurgical Society, reports the result of 21 operations in which he removed the Gasserian ganglion. There were 2 fatal cases, one in a man of 62, who died 2 months after operation from obvious staphylococcic infection which may have been due to an extensive syphilitic ulceration which he had in the nose, and the other in a woman 80 years of age, who died 2 days after operation with signs of apoplexy, the autopsy disclosing a hemorrhage 5 millimeters in diameter in the pons, which was attributed to the separation of the sensory root. Four of the patients were over 80 years of age. Four had conjunctivitis after operation, and one lost an eye. He has never seen a recurrence of pain. He unhesitatingly asserts that the disease is an ascending neuritis beginning in the peripheral branches of the fifth nerve, and that the pain in a large number of cases will recur after peripheral resections, the ganglion being the central seat of the mischief. He therefore advises removal of the Gasserian ganglion in preference to any other treatment, advocating the Hartley-Krause method. He calls attention to the fact that the ophthalmic division, lying as it does on the upper part of the outer wall of the cavernous sinus, is running in a separate tunnel of the dura mater, and that actually the sensory root of the ophthalmic division is

[1] Practitioner, Sept., 1900.

enveloped in a special sheath of dura, so that when you are dragging the ganglion and sensory root out you may leave that portion uninjured.

Dollinger [1] has made extensive investigations upon the cadaver and upon the living subject to discover the exact relationship of the middle meningeal artery to the Gasserian ganglion, and asserts that the **removal of the ganglion without ligature of the vessel** is possible in most instances. The vessel can be avoided by separating the dura mater from the base of the cranium directly from without inward. Often the severe hemorrhage which occurs in this operation arises from injury of the soft parts or from injury of the emissary veins. In 50% of skulls the anterior branch of the middle meningeal artery passes through a canal and not a groove in the parietal bone. The operation of preliminary ligation of the external carotid is thought unnecessary, since when profuse bleeding occurs it can be controlled by pressure over the carotid until the foramen spinosum is plugged, or the bleeding may be controlled by direct pressure while the artery is being ligated. Dollinger suggests further that injury of the artery when the osteoplastic flap is turned back can be avoided by making the anterior corner of the bone flap at a spot posterior to the line of passage of the vessel.

Before the Section on Surgery at the International Congress of Medicine Krause [2] reported **24 cases of intracranial resection of the trigeminal nerve.** Resection of the branches of the trigeminal nerve is uncertain in its results, and therefore, when the skull is opened, extirpation of the ganglion should be performed. The author has performed this operation 24 times upon patients varying from 30 to 72 years of age. In each case he employed the operation devised by himself in 1892. He is able to report 2 patients 7½ years after operation; 2, 6 years after operation; 1, 5 years; and 1, 4 years and 3 months, all of whom have remained free from pain.

Krause [3] describes his operation of **removal of the Gasserian ganglion.** In order to expose thoroughly the ganglion it is necessary to separate gently the temporal lobe from the middle cranial fossa. If this is not done, a large part of the operation must be accomplished in the dark, with the danger of injury to neighboring blood-vessels. Krause has modified his method of opening the skull, so that freer access to the field of operation is obtained. It is his custom now to remove the portion of bone at the base of the osteoplastic flap. This is readily done and renders intracranial manipulation much easier.

Wallace Neff,[4] after a careful review of the literature of the **surgery of the Gasserian ganglion,** reaches the following conclusions: "(1) Trigeminal neuralgia is an ascending neuritis, peripheral in origin. The second and third branches, rather than the first, are the ones most likely to be involved. (2) If the disease persists after several months' trial with drugs, electricity, etc., surgical intervention is indicated. (3) If only one branch is involved and the disease is not of long standing,

[1] Centralbl. f. Chir., No. 44, 1900.
[2] Brit. Med. Jour., Oct. 13, 1900.
[3] Centralbl. f. Chir., No. 16, 1900.
[4] Med. News, Dec. 22, 1900.

as much as possible of the affected branch should be removed with a view to relieving pain and preventing the upward progress of the disease. (4) If more than one branch is involved, and the pain is severe and has persisted for a long time, the ganglion should be extirpated, all other means having failed. (5) The temporal route should be followed, the Hartley-Krause, or preferably Cushing's modification of it, being the most rational procedure. (6) Pain will not recur with original severity in more than 1% or 2% of the cases operated upon, or in any degree in more than 4% or 5%, and is invariably due to an incomplete operation. (7) It is important to remove the ganglion and its branches intact in order to be certain of the completeness of the operation and to insure a careful and thorough microscopic examination of the specimen. (8) The present mortality is about 10%. Increased experience and an improved technic will undoubtedly diminish this mortality, and dissipate the risks of this hitherto most formidable, difficult, and dangerous operation."

Alexander [1] reports a case of **status epilepticus** in which trephining and drainage resulted in recovery. The patient was semiconscious on admission, and during 20 hours had had 40 fits. She was apparently in a moribund condition. When a disc of bone was removed, the dura mater bulged into the opening. A considerable amount of cerebrospinal fluid escaped when the membranes were divided. Alexander thinks that trephining in these apparently hopeless cases is justifiable, since the removal by drainage of the serous effusion which is sometimes present, or venesection of the congested cerebral veins, will greatly relieve cerebral tension.

At the Thirtieth Congress of the German Surgical Association Braun,[2] of Göttingen, reported 9 cases of epilepsy treated by the **removal of the sympathetic cervical ganglion,** as suggested by Jonnesco. He finds it impossible to remove all three of the ganglia. The incision posterior to the sternomastoid muscle is considered the best for this operation. He has found it impossible to locate the lower ganglion. When the superior ganglion was removed, there followed always ptosis, contraction of the pupil, and dilation of the vessels, but no change in pulse or respiration. The contraction of the pupil disappeared gradually and the dilation of the vessels disappeared after 24 hours. Five of the patients were improved after operation and 2 died. The value of the operation is considered doubtful, but the operation itself is not considered dangerous.

Burghard [3] reports 3 cases in which the **superior cervical sympathetic ganglion** was removed. The first patient was a woman 63 years of age, who suffered from subacute glaucoma. This patient was in no wise benefited by the operation. Burghard prefers the incision along the anterior border of the sternomastoid muscle, thinking that it gives better exposition of the parts. A posterior incision gives the best access when it is desired to remove the three ganglia. He does not

[1] Lancet, Sept. 22, 1901. [2] Am. Med., May 4, 1901.
[3] Brit. Med. Jour., Oct. 20, 1900.

open the carotid sheath, but draws it forward with a blunt hook, which usually exposes the superior ganglion. In the first patient the ganglia on the two sides were widely different in size. The second patient was a man 63 years old, who suffered from a recurrent epithelioma in the glands on the right side of the neck. At the operation it was found that the superior cervical ganglion was firmly adherent to the enlarged gland. When the ganglion was handled, the pulse-rate increased from 74 to 98. The patient suffered from intense pain before the operation, which disappeared after the ganglion was removed. The third patient was a man 44 years old, who suffered excruciating pain from a small swelling in the neck. Upon removing this growth it proved to be a "false neuroma" involving the superior cervical ganglion. The growth was unusually large. The three constant symptoms following the removal of the ganglion in all of these cases were ptosis, severe pain in the head upon the side operated upon, and congestion of the vessels of the face. Contraction of the pupil was also a temporary postoperative symptom.

Hartwig [1] reviews the present status of the **Jonnesco operation** and expresses the belief that it is an operation which will win its place in the surgical treatment of epilepsy.

J. Shelton Horsley [2] records a case of **excision of the cervical sympathetic ganglia** for exophthalmic goiter. The patient was a Mexican woman 26 years old, who suffered from cardiac palpitation and throbbing in the neck. The pulse varied from 120 to 140. Horsley operated in this case on the theory, advanced by a number of authorities, that the condition had its origin in the derangement of the sympathetic center. Under chloroform anesthesia the sympathetic ganglia on the right side were removed with considerable difficulty. The patient's pulse was very rapid during the operation, varying from 170 or 200 to a rapidity which could not be estimated. It was therefore thought unwise to attempt the excision of the ganglia of the left side. Twice during the operation the pulse suddenly dropped to about 72, a fall supposed to be due to irritation of the pneumogastric. After the operation the patient's temperature rose to 104° and the pulse remained about 160; vomiting continued at intervals for about 24 hours. The following morning her temperature was 100° and the pulse 110. Having been greatly relieved from the throbbing which had previously been so annoying, and the wound having healed primarily, the patient left the hospital 6 days after the operation, with a pulse of 92. Two months after the operation her pulse was 90 and she suffered from no throbbing or palpitation. The exophthalmos was greatly diminished, but there was occasional pain in the right side of the head and face and a keloid had developed in the scar. There was little change in the size of the gland. Great improvement is considered the result of the operation, and if the patient does not continue to progress favorably the author will recommend excision of the left cervical sympathetic ganglia.

[1] Jour. Am. Med. Assoc., July 7, 1900. [2] Ann. of Surg., Apr., 1901.

Alfred Clark [1] presents the history of a case of **arrested mental development following depressed fracture of the skull** in which trephining resulted in marked improvement. The patient was 11 years of age and had been 3 years in an asylum because of idiocy. The child was bright and intelligent until 4 years of age, when she fell and struck her head. Subsequent to the fall epilepsy developed, the attacks being preceded by a spasm of the right arm and leg. After this fall she made no mental advancement, and finally reached a condition in which she could not be left alone. Examination was very difficult because of the child's behavior, but a depression of the skull was found in the left occipital region near the parietooccipital suture. When this depressed portion of bone was removed, the meninges were found enormously thickened and adherent. A portion of the dura was removed and the remaining adhesions separated. Two months after the operation the child showed a great deal of improvement. She had had no fits, was able to go about alone, and in every way showed a rapid advance in intelligence.

Bevan [2] discusses the subject of **traumatic neuroses** from the standpoint of a surgeon. He asserts that "the medical attendant in the majority of cases is more than any other factor responsible for the development and continuance of the condition known as traumatic neurosis." Bevan had an opportunity of studying the results of injuries received in a large railroad wreck. Twenty-four of the patients who claimed and received damages for permanent injuries to some part of the nervous system subsequently recovered their health absolutely. Each of these 24 patients submitted medical opinions that a permanent injury of the nervous system had been sustained. Most of these were cases of traumatic neurosis and a few were malingerers. The physical injuries in these cases were either very slight or entirely absent. It is interesting to note that among the cases of severe injuries none developed traumatic neurosis. After a careful discussion of this subject Bevan reached the following conclusions: "(1) Real injuries of the nervous system present positive and immediate symptoms. (2) Those alleged injuries of the nervous system, without positive and immediate symptoms of gross lesion, are either cases of malingering or abnormal cerebral states, traumatic neuroses, or a mixture of the two. (3) Traumatic neuroses are the result of two factors: (*a*) a brain readily affected by suggestions; (*b*) suggestions furnished by an accident with or without injury to the individual, suggestions furnished by sympathetic care or a craving for sympathy, and lastly, and of greatest importance, suggestions furnished by medical attendants. (4) To establish a diagnosis requires the immediate and sometimes protracted observation of the patient, as in the study of any psychosis. The supposed refined means of diagnosis, as the dynamometer, esthesiometer, and electricity, are seldom of value and are often of positive harm as suggestions to the patient. (5) These cases recover rapidly under proper surroundings and advice when the continuing causes are removed. Recovery may be indefinitely postponed under improper surroundings and advice. (6) No secondary degenera-

[1] Lancet, Nov. 3, 1900. [2] Jour. Am. Med. Assoc., Sept. 22, 1900.

tions of the nervous system follow traumatic neuroses. The pathologic conditions due to an old-standing traumatic neurosis are the degenerations of disuse and the general deterioration of the individual from confinement, lack of exercise, dejection, etc. (7) The subject of traumatic neuroses will not receive its proper place until the medical profession recognize their responsibility in the development and continuance of these conditions, and until proper means are provided for the punishment of malingerers and their alleged medical experts."

XX

Poirier [1] reports an interesting case of **fracture of the anterior fossa of the skull** with a resulting meningitis which was cured by bilateral trephining. The skull was opened on both sides above the auditory meatus with mallet and chisel. The dura was opened and a reddish liquid flowed out, which upon examination was found to contain Staphylococcus aureus. Both wounds were drained and the patient made a satisfactory recovery.

Eads [2] details a number of operations for **injuries to the median and ulnar nerves** which he has performed with a good result in each case. He prefers silk to catgut in these operations. In suturing nerves the greatest care should be taken to see that the nerve is not pressed upon by the resulting cicatrix in the tissue surrounding it.

Kiliani [3] reports a very interesting case of **division of the median nerve by glass.** The nerve was not sutured until 3 or 4 weeks after the accident. At this time small bulbi were excised from the ends. The wound did not heal primarily and there was no improvement after the operation. Six weeks later Kiliani first saw the patient and performed a second operation. He found a neurofibroma of considerable size completely interrupting the conduction of the nerve. The growth was excised and the nerve ends sutured with catgut. Primary healing took place, with immediate restoration of sensation and very soon that of power. Three months after the operation a keloid growth was present in the skin scar and a small tumor could be felt in the nerve. Nine months later the tumor had disappeared and the hand was useful for all practical purposes. Kiliani has been unable, in a search of the literature, to find a case in which a neurofibroma with no indication of sarcomatous degeneration had recurred after extirpation. He believes that the growth in this case can be properly classed as a keloid. At the second operation he found the silk suture which was used at the first operation undergoing absorption, as is shown by the microscopic sections which illustrate his report.

Keen [4] reports 2 instructive cases of **successful secondary nerve suture, one of the posterior interosseous nerve and one of the median and ulnar nerves.** The first patient was a man 38 years of age, who 3 months previous to the operation had suffered a division of the posterior interosseous nerve and common extensor muscle of the fingers. Operation was followed by complete restoration of function. The second case was that of a boy 10 years of age, who 6 months prior to

[1] Rev. de Chir., Feb. 10, 1901.
[2] Jour. Am. Med. Assoc., Mar. 30, 1901.
[3] Ann. of Surg., Jan., 1901.
[4] Phila. Med. Jour., June 1, 1901.

operation had received an injury by which the median and ulnar nerves were divided. In this case also an excellent result was obtained. Attention is called to the late periods at which the secondary suture in these cases was done. In suturing the posterior interosseous nerve Keen found it of advantage to insert the sutures before excising the bulbous ends.

LaPlace [1] reports a case of **secondary suture of the ulnar nerve 17 months after its division.** Because of a neuroma which had developed it was necessary to resect 1½ inches of the nerve. Approximation of the nerve ends was accomplished after they had been steadily stretched for some time. The result was most satisfactory.

A. de Page [2] relates a case of **dislocation of the elbow** in which the median nerve was displaced behind the internal condyle. The nerve was freed by operation and restored to its normal position.

DISEASES OF THE MUSCLES, FASCIA, ETC.

John Knott,[3] in a paper on **Dupuytren's contraction** of the palmar fascia, read before the Surgical Section of the Royal Academy of Medicine in Ireland, calls attention to the fact that the condition begins almost invariably on the right side, the ring finger suffering first, then the little finger, and lastly the middle finger. He has never seen the index finger more than very slightly involved, and the thumb never, it receiving no slip from the palmar fascia. The ring finger, having no special extensor and being bound by the slips passing from its tendons on either side to those of the middle and little fingers respectively, presents a point of least resistance when contraction of the palmar fascia sets in. He notes the glossy condition of the skin in these cases, its nutrition being impaired by the extension of the inflammatory trouble along the pegs of dense fibrous tissue, which nail the skin to the deep fascia of the palm, and the great thickening of the normal prolongations of the fascia along the sides of the first and second phalanges. He believes the cases can be greatly benefited, but that a perfect cure is never obtainable.

A. H. Tubby [4] says **Dupuytren's contraction of the palmar fascia** usually begins in the ring finger and spreads to the middle and little fingers and not infrequently to the index finger. In selected cases he favors excision of the affected portions of the fascia. There is no liability of recurrence, and if there be any truth in the bacillary theory of the origin of this condition, the whole of the diseased tissue should be extirpated. By this method the time of treatment is shortened and no expensive apparatus is necessary. It is difficult to dissect the skin from the thickened fascia without buttonholing it; frequently the thickened epidermis is stripped from the cutis vera, which is firmly attached to the fascia beneath. It is best to remove the contracted bands from below upward, tracing the digital vessels and nerves from their divisions up toward the wrist. If the fingers still maintain their flexed position, a fine tenotome may be passed under the skin and the restraining fibrous

[1] Am. Med., Apr. 6, 1901. [2] Ann. de la Soc. Belge de Chir., Jan., 1901.
[3] Dublin Jour. Med. Sci., Nov., 1900. [4] Lancet, Jan. 12, 1901.

bands divided on the lateral aspects. Arteries should be twisted rather than tied, as the ligatures may later cause trouble. If there be much contraction of the fingers, they should not be straightened immediately, as considerable pain is caused by the stretching of the digital nerves, which also share in the contraction. **Club-hand** is rare and is usually congenital. The classification is similar to that adopted for club-foot: radial and ulnar, palmar and dorsal club-hand, and the mixed forms as radiopalmar, radiodorsal, ulnar-palmar, and ulnar-dorsal. The condition may be grouped morphologically into (1) those cases in which the articular line is abnormally inclined; (2) those in which the osseous parts are deformed, usually consisting of a shortening of the radius and an atrophy of the carpal bones; and (3) those in which the skeleton of the part is incomplete; the radiopalmar variety is generally of this group. Treatment is often unsatisfactory. Tenotomy, passive motion, and massage are sometimes helpful. Cases of **tendon-suturing** after accidental division are not infrequently followed by incomplete union even subsequent to the most careful apposition. The result depends on the power of retraction of the severed tendon, on the limitation of this retraction by the fibrous tissue which binds it in its groove, and on the character of the tissues at the point at which the division has taken place; if the tendon be surrounded by considerable vascular areolar tissue, union will occur even if there be retraction of the divided ends. The extensors of the fingers give better results than the flexors, as they are more firmly attached to the integument, to their sheaths, and to each other. Retraction is greater above the wrist than below it. When the extensors of the wrist are divided at the back of the wrist, they separate about 1 centimeter and prompt union occurs, as they are bound to the periosteum; when divided over the metacarpal bone, the proximal end retracts 3 or 4 times as much and firm union is rare, because the tendon is loose in its sheath and the sheath is but loosely attached to the surrounding tissues. At the metacarpophalangeal joint the tendons are firmly bound to the capsule of the joint, and they do not retract even when the articulation is opened. On the flexor aspect of the wrist retraction after division is marked, but union after suture is prompt and firm because of the well-nourished structures which surround the tendons. The superficial flexors lying in tubes of fascia do not retract as much as the deep ones. After suture the wrist should be kept flexed for at least 4 weeks, and the same time should be consumed in bringing the fingers to full extension. In a deliberate operation on the flexors the wrist is the seat of election, as here new tendon-formation is more liable to occur, and the precise length of this may be determined by the degree of flexion of the hand to the forearm which is maintained.

H. L. Barnard[1] reports **2 cases of contracture of the flexors of the forearm treated by tendon lengthening.** The first patient was a girl, aged 3 years, who presented marked flexion of the fingers following splint sores, she having been treated for a fracture of both bones of the forearm about the middle. Six months after the injury an

[1] Lancet, Apr. 20, 1901.

incision was made down the middle of the forearm, from just below the elbow nearly to the wrist, the flaps reflected, and the tendons, which were about the size of stout twine, and the muscles, which were pale, firm, fibrous, and dry, exposed. Four tendons of the flexor sublimis digitorum, the flexor longus pollicis, and six strands of the flexor profundus digitorum were lengthened by splitting them down the center, severing the halves above and below on opposite sides, and allowing them to slip past each other until the requisite length was obtained, and then suturing the divided ends with fine silk. Confusion was prevented by passing a guide suture through the tendons of the sublimis as they were divided and drawing them aside. The second patient was a boy, aged 4 years, who presented a similar condition subsequent to a severe contusion of the arm. The same tendons operated on in the first case were lengthened in this patient also. Improvement was so marked that after 4 months an attempt was made to secure rotation in the forearm, which was pronated and fixed. The pronator radii teres was lengthened, but the forearm remained fixed. The pronator quadratus was then separated from the ulna and supination effected. The present condition of these patients is almost identical. The fingers and thumb are straight, all the tendons united so that partial flexion can be performed and the children can grasp a stick or pick up a pin, but neither can make a fist. Improvement is still progressing 5 and 8 months after the operation on the first and second cases respectively. Muscular contracture is either myogenic or nervous. Myogenic contracture is ischemic, following the application of tight bandages, the rupture of the main artery, or extreme and prolonged exposure to cold, or it may occur after contusion or rupture of the muscles. In both the reported cases the fingers became glossy and cold, and chronic painless whitlows developed some weeks after. The application of a constricting band to make these operations bloodless is contraindicated, as the anemia and pressure may further damage the affected limb.

Rotschild [1] reports **2 cases of myositis ossificans and traumatica.** One involved the brachialis anticus and in the second a bony mass springing from the os calcis embraced the tendo-Achillis; both followed crushing accidents, and in both the bony masses were removed. Twenty-five cases have been collected from literature.

Carl Beck [2] reports a case for which he suggests the name of **tenontitis and tenontothecitis prolifera calcarea.** The patient's large toe was amputated for infection entering through an ulceration produced by calcareous deposits. Thirteen years later he presented a tumor on the dorsum of the right hand, about the size of an apple. This had been growing for 11 years, during which time it had ulcerated and several fistulas had developed. At operation, which consisted of an excision of the mass, the extensor tendons, excepting that of the thumb, were found agglutinated by material resembling mortar. Several concretions were expelled after operation. Staphylococci, but no tubercle bacilli, were found in the excised tissue.

[1] Beitr. z. klin. Chir., Bd. XXVIII, H. 1. [2] N. Y. Med. Jour., Apr. 27, 1901.

DISEASES OF THE SPINE.

Cantani [1] discusses **idiopathic ankylosis of the spine.** The entire spine is rigid, without distortion; other joints, as the hip and jaw, may be involved, but those of the fingers and toes commonly escape. The muscles may waste, but the reactions of degeneration are absent. Males in middle life are most frequently attacked. There is pain in the spine, and there may be a history of gout, syphilis, or rheumatism. Complete ankylosis finally takes place. Cantani says the condition may be ameliorated by setons applied to the most fixed portion of the spine.

Marshall [2] reports a case of **spina bifida treated by operation.** The tumor was as large as a Tangerine orange and situated in the lumbar region. The sac was punctured and the fluid allowed to escape slowly. The sac-wall was next turned in and a Lembert suture applied. The skin was then sutured. Fever and retraction of the head followed, but recovery eventually ensued. The author has operated upon 2 other patients, with complete success in each.

John Lindsay [3] describes a case of **spina bifida** that was apparently undergoing a spontaneous cure. It occupied the lower lumbar and sacral region. The case has been under observation 5½ years.

Howell T. Pershing [4] reports a **bullet wound of the spinal cord.** There was complete absence of motion and sensation below the genitals. A skiagraph showed the foreign body between the twelfth dorsal and first lumbar vertebræ. About a month later a laminectomy was performed and the bullet found in the spinal canal opposite the eleventh dorsal vertebra. Death occurred 24 days later, no improvement having been noticed.

S. H. Weeks [5] writes on **fractures and dislocations of the spine** and reports a case of fracture of the fourth and fifth cervical vertebræ following a fall from a ladder. There was absence of motion in the left arm, but sensation was apparently good. Motion in the right arm and lower extremities was preserved and the patient was unable to pass urine. Ten days after the injury the laminas of the fourth and fifth cervical vertebræ were removed; great improvement followed the operation. Weeks says dislocation alone, although rare, does nevertheless occur. It is almost wholly confined to the cervical region, occurring most frequently in the lower half. The upper vertebra is almost invariably displaced forward. Agnew gives a table of 24 cervical dislocations, 11 of which were verified by autopsy. Lower in the spine fracture is usually associated with the dislocation. The author believes that laminectomy should be performed in every case. If such displacement be found that removal of the neural arch does not suffice to relieve pressure, the operation may be extended to the articular processes, so that manipulation may succeed in reducing the dislocation. Five or 6 of the arches may be removed if necessary and the cord

[1] Il Policlinico, f. 8, Sept. 1, 1900. [2] Brit. Med. Jour., June 22, 1901.
[3] Glasgow Med. Jour., Sept., 1900. [4] Phila. Med. Jour., Nov. 10, 1900.
[5] Am. Med., May 18, 1901.

drawn to one side, in order to examine, and if necessary operate on, the bodies of the vertebræ. Hemorrhage, infection, and the administration of an anesthetic in the prone posture are the dangers. The spinal canal is difficult to expose, the vertebræ are often so badly broken and distorted that they cannot be dealt with satisfactorily, and the spinal cord is frequently hopelessly disorganized. The dura should always be carefully examined; if there be no pulsation, it is generally due to adhesions, or to other interference with the continuity of the subdural space; blood is indicated by a purplish, and pus by a yellowish, hue; tumor or increase in the cerebrospinal fluid will give increased tension and elasticity to the dura. Most operators believe that the dura should be opened. The canal can be explored by a bent probe. The author advises drainage, and a plaster-of-Paris dressing or sand bags to support the spine.

Thomas [1] gives a lengthy report of 2 cases of **tumor of the spinal cord.** The first patient was a young woman who gradually became paraplegic during the course of 10 months. Motion and sensation were abolished and paralysis of the sphincters was complete. From this time on there was no pain, an unusual thing in tumors of the cord. Contractures gradually developed. At the end of 13 years she died from sepsis and exhaustion. Autopsy revealed an endothelioma of the dura which had completely destroyed the nervous elements of the cord just below the cervical enlargement on a level with the spine of the scapula. The second case was a boy of 6 years who 2 days after a trifling injury developed weakness and pain in the right upper extremity. The arm became paralyzed and the leg paretic. Seven weeks after the first symptoms had been noticed he suddenly died with symptoms of interference with respiration. The autopsy showed a glioma of the cervical enlargement of the cord, into which hemorrhage had taken place.

DISEASES OF THE KIDNEYS AND URETERS.

Reuben Peterson [2] presents an exhaustive article on **ureterointestinal anastomosis,** giving a full review of the history of the operation and reporting the results of an extensive experimental research. The author has taken great pains to deal with the subject from every point of view. He shows conclusively that placing the ureters in the rectum is a procedure not only accompanied by a high mortality, but that in few instances does the patient escape a subsequent infection of the kidney. This infection may take place even when the trigonum is transplanted. This latter plan, however, is the only justifiable one. Peterson's modification of Maydl's operation is shown in the accompanying illustrations, and his conclusions regarding ureterointestinal anastomosis are as follows: "(1) The primary mortality of ureterointestinal anastomosis, both in experimental work on animals and in man, is exceedingly high. (2) The best technic is that requiring the least amount of sutur-

[1] Jour. Nerv. and Ment. Dis., Nov., 1900.
[2] Jour. Am. Med. Assoc., Feb. 16 to Mar. 23, 1901.

ing of the ureters themselves. (3) All efforts to prevent ascending renal infection in animals or in man where the ureter has been implanted without its vesical orifice have proved futile. (4) It is impossible to determine in advance the extent of the infection which will result from ureterointestinal anastomosis. The patient may die in a few days of a

Fig. 45.—Author's modification of Maydl's operation (ureterotrigonointestinal anastomosis); rectangular vesical flap containing ureteral orifices; ureters have been dissected free from their peritoneal coverings in order to be more plainly seen (Peterson, in Jour. Am. Med. Assoc., Mar. 23, 1901).

Fig. 46.—Showing incision through intestinal serosa and muscularis; long margin of vesical flap united to one side of bowel incision by right-angled through-and-through continuous suture (Peterson, in Jour. Am. Med. Assoc., Mar. 23, 1901).

Fig. 47.—Showing method of turning angle and the inversion of the peritoneal surface of flap (Peterson, in Jour. Am. Med. Assoc., Mar. 23, 1901).

Fig. 48.—Showing the removal of the mucosa by the scissors; up to this time the bowel has remained closed (Peterson, in Jour. Am. Med. Assoc., Mar. 23, 1901).

Fig. 49.—Suture of flap completed; peritoneal edges still further rolled in by a series of Lembert sutures (Peterson, in Jour. Am. Med. Assoc., Mar. 23, 1901).

pyemia or in a short time of pyelonephritis, or in rare cases may recover from the infection, with resulting contracted kidneys. (5) Hence the operation is unjustifiable, either for the purpose of making the patient more comfortable, as in exstrophy of the bladder, vesicovaginal or ureterovaginal fistula, or for malignant disease of the bladder. (6) The results of ureterointestinal anastomosis through the formation of vesico-

rectal fistulas have not been favorable up to the present time. (7) The success of Frank's experimental work in vesicorectal anastomosis justifies the expectation that the future results of this operation will be more satisfactory. (8) The primary mortality of ureterotrigonointestinal anastomosis is low for an operation of this magnitude. (9) While it cannot be denied that ascending renal infection may occur after this operation, the infection, as a rule, is of such a type that the chances of the individual's overcoming it are good. (10) Hence the operation of implanting the vesical flap with its ureteral orifices into the intestine is a justifiable surgical procedure. (11) There is no valve guarding the vesicoureteral orifice; nor does the circular muscle layer of the ureter nor do the bladder muscles themselves act as a sphincter. (12) It has been abundantly demonstrated by experimental and clinical work that the rectum tolerates the presence of urine and acts as a good substitute for the bladder, and that good control over the anal sphincter will be maintained."

B. R. Schenck [1] reports 4 cases of **calculus impacted in the ureter,** which were operated upon by Kelly and Halsted. The first patient was a woman 29 years of age, under the care of Kelly. A diagnosis of calculus impacted in the ureter was made by catheterization of the ureter with a wax-tipped catheter. Catheterization of the opposite ureter showed it to be patulous. When the ureter was exposed, it was found to be enormously enlarged and very adherent. It was occluded by a calculus measuring $1\frac{2}{5}$ inches in length and $\frac{3}{5}$ inch in diameter. The calculus was situated near the termination of the ureter. The distended portion of the ureter was about the size of the descending colon. The kidney and ureter were removed with considerable difficulty. The wound was closed after the insertion of a gauze drain and the patient made an uneventful recovery. The second patient of Kelly was a woman 37 years of age, who gave a history of repeated attacks of hydronephrosis. For 6 weeks hydronephrosis had been permanent. Operation in this case was done through the peritoneal cavity. The kidney was found enormously dilated, its cortex being about $\frac{1}{2}$ inch thick. Three hundred and seventy cubic centimeters of pale urine was evacuated together with a small stone. At a point $1\frac{1}{5}$ inches within the ureter two other small stones were found and removed. The removal was accomplished with considerable difficulty and required an incision $1\frac{2}{5}$ inches long in the ureter. The incisions in the pelvis and in the ureter were closed with silk and a gauze drain inserted. The patient made a satisfactory recovery. The third case was a woman 32 years of age in whom there was a history of pyuria of long standing. Upon admission hydronephrosis was present. Catheterization of the ureters showed that the left was patulous, although scratch marks were visible upon the wax tip of the catheter; and the right was partially obstructed about $2\frac{3}{5}$ inches from the bladder, as was shown by several deep scratches upon the wax tip. A skiagraph showed a shadow in the region of the left kidney and another on the right side lower down. Kelly exposed

[1] Jour. Am. Med. Assoc., May 11, 1901.

the left kidney and evacuated a considerable amount of purulent urine together with a large calculus. As the hemorrhage accompanying this operation was very great, interference with the right ureter was postponed until 1 month later. At this time it was exposed and a calculus located about $2\frac{3}{5}$ inches from the vesical orifice. The stone was located through an abdominal incision, but was removed through the vaginal vault, and the abdominal wound closed. A ureteral catheter had been introduced before the operation was begun and was used as a guide during the removal of the stone. The catheter remained in position 16 hours after operation and during that time drained 660 cc. of urine. The vaginal wound closed after a short time and the patient made a good recovery. The fourth case was a woman 56 years of age, under the care of Halsted. The patient suffered from hydronephrosis. Examination of the ureter with a wax-tipped catheter showed a calculus high up in the ureter. When the ureter was exposed, it was found that the calculus had descended considerably, so that it could be removed through the vaginal vault as Kelly had done in the previous case. This was done and urine drained through the vagina for 16 days, when the wound closed and the patient made a good recovery. Schenck concludes his article with a classification of 84 cases operated upon for stone in the ureter. In 19 instances the calculus was located within 6 centimeters of the kidney, in 8 at or near the pelvic brim, and in 41 within 5 centimeters of the vesical orifice.

Bevan [1] discusses the **diagnosis of stone in the kidney by the x-ray and its treatment.** After a reference to the etiology of renal calculus, Bevan expresses his acceptance of the conclusions of Harris regarding the causation of kidney stone as very probable, but not absolutely proved. The fact that it has been shown that gall-stones may be caused by bacteria would tend to make one accept the theory of the bacterial origin of renal calculi. The examination of the secretion of each kidney and the use of the ureteral sound and the wax-tipped bougie of Kelly are considerable aids to diagnosis. The x-ray, however, has revolutionized the diagnosis of renal stones. Unlimited praise is given to Leonard, of Philadelphia, for his work in perfecting the localization of renal calculi with the x-ray. Bevan's experience with the x-ray corresponds to that of Leonard, and he says that "a perfect skiagraph with a proper amount of detail and differentiation is of greater value as a means of diagnosis than an exploratory operation." A skiagraph is reproduced which shows a single stone in the kidney, which was located by means of the x-ray after an exploratory operation had failed to discover it. Reference is made to 2 cases in which, had not the x-rays demonstrated the presence of more than one stone, he would have been content with the removal of the largest stone present and would have allowed a smaller one, which could not be felt, to remain in the kidney substance. Bevan presents three skiagraphs, taken a year apart, which show the gradual growth of a kidney stone. He thinks that the mortality of nephrolithotomy is less than is generally supposed.

[1] Ann. of Surg., Mar., 1901.

In his personal experience no deaths have occurred from this operation. The prognosis after removal of a renal calculus is not so good as that in gall-stones or in stones forming in the urinary bladder. Even though no new stones form, pyelitis may persist. It is strongly urged that in the operation of removing stones from the kidney this organ should be freely exposed and brought into view. The incision recommended is an oblique one beginning one finger's breadth below the last rib and running downward and outward to a point a finger's breadth above the anterior superior spine. One of the advantages of this incision is that it can be prolonged for the exposure of the ureter when this is desired. Regarding injury to the renal vessels during manipulation of the kidney, Bevan has shown by experiments upon the cadaver that after injecting the arteries with plaster and the veins with a preservative fluid the kidney can be brought out through the incision without any danger of injury to its blood-vessels. Of course, where there are old perinephritic adhesions, delivery of the kidney through the wound may be both dangerous and impossible. Much greater liability of injury to the vessels occurs when working through a small incision than when the incision is a large one. Precaution should be taken in removing small stones from the pelvis that they are not pushed down into the ureter. Such an accident can be avoided by compressing the ureteral opening between the finger and thumb.

M. L. Harris, [1] before the Chicago Surgical Society, in discussing kidney stones said that it was **quite probable that all kidney stones were of bacterial origin** and that he would restrict the terms "primary" and "secondary" to the state of the kidney, using the former when the kidney is free from active bacterial invasion and the latter when bacterial infection is present.

Christian Fenger, [2] before the Chicago Surgical Society, said that he considered the **x-ray** a most valuable **aid in diagnosis of renal calculi,** and that he agreed with Bevan and Harris that it were better to remove a stone through the pelvis than through the kidney tissue, if it could be distinctly felt in the pelvis.

Jacob Frank [3] says that he thinks **ureteral implantation into the bowel** is not an operation of choice, but one of necessity, and that it is preferable to nephrectomy and justifiable in certain cases of cancer of the bladder in which the outlets of the ureters are encroached upon. Where the ureter is wounded high up and an anastomosis or repair cannot be made, a unilateral implantation is indicated. The author reports 10 experiments which he has performed on dogs, and minutely describes and illustrates the technic of the operation. An incision is made longitudinally through the peritoneal coat, which is then loosened and retracted; the muscular and mucous coats are then divided longitudinally, the ureters inserted and fixed to the mucous membrane below this incision, which is then closed transversely. The transverse closing of this longitudinal incision tends to prevent any compression of the ureter.

[1] Ann. of Surg., Mar., 1901. [2] Ann. of Surg., Mar., 1901.
[3] Jour. Am. Med. Assoc., May 25, 1901.

The peritoneal coat is then sutured. This method prevents any possible infection of the peritoneal coat by means of the sutures, as those entering the bowel are entirely inclosed beneath the peritoneal coat. In a large majority of the dogs operated upon inflammatory changes in the kidneys took place.

Peters [1] reports a case in which he first operated for **procidentia recti** and subsequently for **exstrophy of the bladder.** The first operation was performed when the child was 2 years and 7 months old. The prolapse of the rectum extended for 4½ inches, and during the act of defecation the protrusion measured 8 inches. There did not appear to be any hernia occupying the peritoneal culdesac. The abdomen was opened in the median line and the bowel easily drawn into its normal position. A fold was then made in the anterior wall of the rectum by introducing two rows of Lembert sutures. The rectum was finally fixed to the anterior abdominal wall. The exstrophy of the bladder was operated upon after a unique method. The rectum was first thoroughly cleansed and a sterile sponge carried well up into the bowel to prevent any fecal matter from coming down. A small catheter was then placed into each ureter and fixed. The ureteral orifice with a portion of the mucous membrane was then separated from the rest of the bladder. The rectum was pushed forward and a small incision made in either side of this bowel without opening the peritoneal cavity. Through these openings a forceps was passed from the bowel, which grasped the rubber tube fixed in the ureter and drew the latter organ well into the rectum. The two tubes occupying the ureters were allowed to remain in position for two or three days. The ureters were not sutured to the rectal mucous membrane, but quickly became firmly attached to it. The patient made a good recovery, and 18 months after the operation was in excellent health, there being no evidence of any rectal irritation or kidney infection. The avoidance of entering the peritoneal cavity is the author's principal claim for this operation.

In a letter to the "Journal of the American Medical Association," April 27, 1901, G. R. Fowler objects to the way in which Peterson has classified his case of **ureteral implantation into the rectum.** Peterson asserted that all efforts to prevent ascending renal infection when the ureter had been implanted without its vesical orifice had proved futile. Fowler asserts that his case is perfectly well and goes to show the fallacy of the above statement by Peterson.

A. Gubaroff [2] found it necessary, in removing a **large fibrosarcoma,** to **resect a portion of the ureter.** An anastomosis was made by invaginating the upper into the lower end. The suturing was facilitated by the introduction of a sound through a longitudinal slit. The patient died 1 month later from causes independent of the operation. At the autopsy the anastomosis was found in good condition, there being perfect union and no narrowing of the caliber.

Howard A. Kelly [3] discusses the questions of **ureteroureterostomy**

[1] Brit. Med. Jour., June 22, 1901. [2] Centralbl. f. Chir., Feb. 22, 1901.
[3] Jour. Am. Med. Assoc., Oct. 6, 1900.

and **ureterocystostomy.** Ureteral anastomosis is considered as difficult and delicate an operation as the surgeon is called upon to perform. Fortunately, most of the injuries of the ureter occur in its pelvic portion. Occasionally the pelvic disease has so involved the ureter as to occlude it completely. Kelly has been able to collect from literature 5 instances of complete occlusion of the ureter. When both ends of the ureter are accessible, and when there is no obstruction between the lower end and the bladder, an anastomosis should be made. When the lower end of the ureter has been destroyed or occluded by disease, or is inaccessible, the proximal portion should be anastomosed into the bladder. Kelly has devised an instrument which greatly facilitates ureteral anastomosis. "The method of anastomosing with the guide is the following: A fine silk mattress-suture is passed through the under surfaces of the cut ends and tied, bringing them snugly together. A longitudinal slit is then made in the upper part of the ureter 2 cm. distant from the end, just large enough to admit the guide easily. The rounded end of the guide is then pushed through the slit into the ureter down through its open end and well into the lower end, where it is loosely tied behind the swelling at the head to hold it in place during the passage of the rest of the sutures. The end-to-end anastomosis is now completed by passing fine silk sutures, either interrupted or mattress, with the sides very close together, at intervals of from one to one and a half millimeters, including all the coats except the mucosa. During the suturing, the ureter can be rotated from side to side by moving the handle of the guide. At the completion, the string tied around the lower end of the guide is cut and the guide withdrawn. The success of the

Fig. 50.—Kelly's ureteral guide.


Fig. 51.—Ureteroureterostomy (Kelly, in Jour. Am. Med. Assoc., Oct. 6, 1900).

suturing may now be tested by injecting water with a syringe through the cut and seeing it flow freely down toward the bladder without leakage at the junction of the ends. The slit is next readily closed by three or four fine mattress sutures of silk as after any other simple ureterotomy." In anastomosing the ureter and bladder the instrument is used in the following way: "A hole is made in the top peritoneal surface of the bladder and the guide slipped in and the right or left vesical cornu pushed out in the direction of the divided ureteral end, and an opening made at the nearest point, just large enough to admit the ureter. The end of the guide is then slipped well up into the ureter and tied, and the ureter, with its lower end slit up for at least half a centimeter, is drawn well into the bladder and stitched on all sides to the muscular vesical wall. After this the guide is removed and the abdomen closed with a small gauze drain in event of leakage." Six cases of ureteral anastomosis are reported with 1 death. These operations were all done before Kelly had devised his instrument.

Maurice H. Richardson [1] reports a case of **calcified fibroid of the uterus** in which the ureter was involved. The ureter was in the midst of the growth and had been so pressed upon that the proximal portion and the pelvis of the kidney were much dilated. The growth was removed with the greatest difficulty and was so tightly adherent to the sigmoid that this portion of the bowel was injured to such an extent that a number of sutures were required to close it. The ureter was anastomosed with the bladder and the patient made an uneventful recovery.

L. L. McArthur [2] writes upon the **treatment of septic infections of the kidney and cystonephroses.** The treatment is divided into internal medication, local applications consisting of ureteral lavage and antiseptics, and surgical interference. McArthur has had no experience with the local treatment of renal infections; excellent authorities, however, have reported favorable results from lavage of the renal pelvis. The source of infection should always be sought for and removed. One of the most important parts of the treatment is the maintenance of a rigid hygiene in the bladder. Bacillus coli communis is one of the most frequent sources of renal infection. If medicinal and local treatment fail, as they do in the majority of cases, nephrostomy should be performed. Such cases should always be operated upon by the retroperitoneal route. McArthur prefers an incision which is nearly transverse and about a finger's breadth below the last rib.

Rummo [3] reports a case of **echinococcus cyst of the kidney** which reached nearly from the left iliac crest to the sixth rib. The tumor was somewhat movable and its margins were rounded. Rummo discusses at considerable length the differential diagnosis of tumors of the kidney, spleen, and retroperitoneal growths. The diagnosis in this instance was confirmed by the introduction of a needle and the withdrawal of fluid containing echinococci.

Ludwig Stein [4] says that **nephrectomy** should constitute a part of

[1] Boston M. and S. Jour., Jan. 24, 1901.
[2] Medicine, Mar., 1901.
[3] La Riforma Med., Dec. 4, 1900.
[4] Wien. klin. Woch., Oct. 25, 1900.

the treatment of **echinococcus cyst of the kidney.** When practically all of the kidney substance has been destroyed it is useless to incise and drain; such a case demands nephrectomy. The operation to be performed must be decided upon after the kidney substance has been thoroughly examined. Often the abdominal incision offers the best opportunity for inspection. When incision and drainage seem to be indicated, the abdominal wound should be closed and drainage should be established through an incision in the lumbar region.

Reymond [1] reports an interesting case in which a **distended gall-bladder** and a **movable and hydronephrotic kidney** were present in the same patient. The difficulty often met in making a differential diagnosis between a distended gall-bladder and a movable kidney is referred to and attention called to the even greater difficulty of diagnosing the conditions when they are both present in the same subject. The patient was a woman 33 years of age, who suffered intense intermittent pain in the right side of the abdomen. There was much abdominal distention and tenderness, also high fever with marked prostration. There was a distinct pear-shaped swelling in the region of the gall-bladder, and behind this could be felt a more extensive tumor which presented the characteristics of an abnormally mobile and enlarged kidney. The kidney was exposed and nephropexy performed. The organ was almost twice its normal size. In front of the kidney and attached to its pelvis could be felt a firm mass which was supposed to be the distended gall-bladder, containing calculi. One week after this operation cholecystostomy was performed and 60 grams of purulent fluid and 4 calculi were removed. The patient ultimately made a good recovery. Authorities differ in such cases as this as to the primary disease. Potain maintains that the gall-bladder is the organ primarily affected, while Roux asserts that the displacement of the kidney is primary. The theory of Roux is that traction is made upon the cystic duct through the hepato-duodenal ligament.

Robert T. Morris [2] describes a method of **fixation for loose kidneys.** To Guyon is given the credit of introducing the method of removing the fatty and a part of the fibrous capsule from about the kidney. The new method which Morris presents consists in stripping the fibrous capsule from the kidney over a large portion of its surface and fastening this flap of fibrous capsule in a slit in the psoas muscle. Occasionally the quadratus lumborum is a more available muscle than the psoas for this operation. It is said that gall-stones frequently result from the pressure exerted on the common bile-duct by a floating kidney. Distention of the stomach is also produced by compression on the duodenum. Edebohls and others have called attention to the fact that the pressure of a displaced kidney upon the superior mesenteric vein will produce congestion of the cecum and appendix, and so predispose to inflammation of the latter organ. The majority of cases of loose kidney do not require operation. The condition is frequently present without giving rise to any symptoms.

[1] Rev. de Chir., June, 1900.

[2] Med. Rec., Feb. 23, 1901.

The surgical treatment of the condition is not so discouraging as many consider it. Edebohls, in discussing Morris's paper, said that he did not think that the fixation of the capsule of the kidney was sufficient to hold the organ in place, and that the strain put upon the organ by coughing, sneezing, and the like is apt to cause it to again become movable. He thought the advantage of Morris's method lay in the fact that the surface of the kidney is extensively denuded and that this permits the formation of adhesions dense enough to hold the organ in its proper position.

A. H. Goelet[1] discusses at length the **diagnosis and surgical treatment of prolapse of the kidney.** True floating kidney is very rare and is always congenital, while prolapsed kidney is very common and always acquired. The author concludes (1) that prolapsed kidney is more frequent than is generally supposed; (2) that it is often not suspected because it does not always give rise to symptoms directly referable to the kidney; (3) that frequently it is not discovered because, by the usual methods of examination, only an expert can detect it, unless the kidney is much enlarged or the subject is thin and the abdominal walls relaxed; (4) that palliative measures, such as abdominal supports, are of no avail and therefore useless and unwise if the degree of prolapse is sufficient to produce symptoms; (5) that fixation of the kidney by suture to the muscles of the back in its normal position is the correct method of treatment. The operation is simple, devoid of risk, and successful when properly executed, when the patient is given careful preparation to avoid vomiting and retching with consequent straining after the operation, and when proper attention is given during convalescence to avoid any strain upon the kidney. The author has found prolapsed kidney in one out of every 4 or 5 gynecologic cases, and about one-half of these suffer sufficiently to require operation. The various supports recommended for this condition produce but little good, except perhaps to limit the prolapse. The author refers to the various supposed causes of prolapse of the kidney, but thinks none of them is perfectly satisfactory. The symptoms of prolapse are as follows: (1) Chronic digestive disturbances, manifested chiefly by intestinal distention and irritability of the stomach; (2) nervousness, restlessness, and insomnia; (3) unusual fatigue after walking or standing; (4) palpitation of the heart, vertigo, and syncope; (5) pain over the pit of the stomach and a little to the left over the region of heart; (6) dragging pains in the loin extending down the thigh and aggravated by standing or walking; (7) inability to rest comfortably on the opposite side from the prolapsed kidney; (8) irritability of the bladder aggravated by standing or walking; (9) jaundice; (10) pain over the region of the appendix, resembling chronic appendicitis; (11) pain referred to the ovarian region on the same side; (12) acute attacks of pain resembling renal colic, which come on suddenly and subside quickly. The gynecologist frequently has cases referred to him for supposed pelvic diseases when the real trouble is prolapse of the kidney. Goelet

[1] Med. Rec., June 1, 1901.

urges in all gynecologic cases that, since under unfavorable conditions the diagnosis of prolapse of the kidney is not easily reached, an examination of the kidneys be repeatedly made. His own method of examination, which he considers very satisfactory, is as follows: The patient is directed to stand with her back to the wall or a table, perpendicular to the floor, her body inclined a little forward, so as to relax the abdominal muscles. The examiner sits in front of her a little to the right and grasps with his left hand the right loin, his fingers behind and his thumb in front, just below the border of the ribs. The patient is now directed to take several deep inspirations and to expire to the extreme limit; at the end of the second or third inspiration he depresses the abdominal wall with his thumb so as to diminish the distance between the thumb and the fingers behind, in this manner approximating the anterior and posterior walls above the kidney if it is prolapsed. With his other hand the right abdominal region is depressed by pushing the tips of the fingers inward and engaging the kidney, if prolapsed, between the tips of the fingers of his right hand and the thumb of the left, which depresses the abdomen just beneath the ribs. In this manner the kidney, if prolapsed, may be outlined, and firm pressure upon it will cause it to glide under the thumb and up into position. When the degree of prolapse is insufficient to demand operation, he says that the symptoms may be relieved by a properly adjusted bandage with a pad over the kidney, but that no cure can result from this treatment. Operation is indicated when symptoms cause positive discomfort or interfere with the health of the patient. When the patient suffers from attacks of acute pain denoting obstruction of the ureter, operation is imperative. The author uses silkworm-gut sutures and carries out his fixation in the following way: The needle carrying the suture is first inserted superficially on the lateral surface of the exposed kidney from above downward in a direction somewhat oblique to its long axis. Then it is inserted deeply through the kidney structure transversely and again superficially on the opposite lateral surface from below upward. The free ends of this suture are passed through the fatty capsule of the kidney and muscles and skin at the upper angle of the wound, so that when they are drawn upon and tied, the kidney is drawn up into position under the ribs. This method of inserting the suture lessens the strain upon the central insertion through the kidney structure. To obviate the cutting of these sutures into the skin, he ties them over a strip of several layers of gauze placed lengthwise over the wound, but before they are tied he inserts a roll of sterile gauze down into the wound and along the border of the kidney, and brings it out at the lower angle of the wound. The object of this is to secure drainage and to excite, by contact with the kidney, a plastic inflammation which aids in its fixation.

Chas. P. Noble [1] discusses the question of **nephrorrhaphy** and reports his personal experience with this operation. Of 40 persons on whom he has operated for movable kidney, 29 are considered cured.

[1] Jour. Am. Med. Assoc., Dec. 15, 1900.

In 4 the operation was a failure so far as symptoms are concerned; 5 patients showed improvement; and in 2 the result is unknown. In speaking of the technic of nephrorrhaphy, Noble says that he makes it a point to deflect the layer of perirenal fat outward and downward so that at the conclusion of the operation it will act as a cushion upon which the kidney can rest. The fatty capsule of the kidney is stripped from the organ, excepting at the hilum. The kidney is sutured with silkworm-gut and the sutures are so passed that, when tied, the knots are just external to the deep fascia. These sutures are not drawn very tight and should not be used to close the wound in the muscles, this being united by interrupted chromicized catgut sutures. The chief objection to the separation of the proper capsule of the kidney is that considerable capillary oozing takes place, with the formation of clots which render infection more liable. Noble did not approve of the method recommended by Senn and Deaver, of suspending the kidney with gauze packing. "In conclusion, the writer would make the following recommendations: (1) Careful discrimination in diagnosis in order to separate cases in which movable kidney is a coincidence in a case of neurosis from those in which it is the cause of local and reflex symptoms. (2) Resort to the rest cure for cases of slightly movable kidney, especially in young women. (3) The employment of symptomatic treatment in cases in which the relation between the movable kidney and the nervous symptoms present is uncertain. Nephrorrhaphy should be employed in these cases only after nonoperative measures have failed to afford relief. (4) The immediate resort to operation in those cases in which local symptoms, such as pain, sense of weight, or symptoms of strangulation, are present, and when the examination of the urine shows indications of congestion of the kidney, such as the presence of hyaline casts or albumin." [Our experience is in accord with Noble's as to the necessity of endeavoring to discriminate between a neurotic condition which precedes or accompanies and one which results from movable kidney. A neurotic condition which is antecedent or causal is not cured by fixing the kidney. Personally we do not advocate the passing of stitches through the kidney substance, but prefer the operation of Nicholas Senn.]

M. L. Harris [1] considers at some length the subject of **movable kidney, its causes and treatment.** It is thought that many of the causes assigned for this condition are erroneous. After a careful study of a large number of cases which he tabulates, Harris concludes that the particular "body formation" of the individual is an important etiologic factor. The shape which tends most to produce movable kidney is that in which the middle zone of the body has contracted to such an extent that the capacity of this portion is much diminished. The constriction tends to depress the kidney, and such acts as coughing, straining, lifting, etc., crowd the kidney further down and increase its range of motion. These factors which contribute to the production of movable kidney are termed "internal traumas." It is thought that a movable

[1] Jour. Am. Med. Assoc., June 1, 1901.

kidney is never the immediate result of a single injury or an external trauma. Often a movable kidney is discovered immediately after an accident and attributed to it when in reality it had probably existed for a long time. The general practitioner should appreciate the frequency of movable kidney in women and not attribute this condition, when discovered, to some recent accident. When a patient suffers from movable kidney, any traumatism about the trunk is apt to produce hematuria. Harris thinks that a frequent mistake which is made in performing nephrorrhaphy is the fixing of the kidney at a point too high up. Stress is laid upon the importance of removing all of the perirenal fat in this operation.

Cartledge [1] reports his experience in **fixation of the kidney through an abdominal incision.** In operating for appendicitis he discovered a very movable kidney and was surprised to find with what ease this organ could be fixed through the wound in the abdomen. In fact, he found it easier to anchor the kidney in this way than through an incision in the loin.

Edebohls,[2] in writing on **bandages for nephroptosis,** presents a synopsis of the various mechanical means which have been devised for the fixation of movable kidney. His remarks are summarized as follows: "Bandages for movable kidney may be divided into two general classes: (1) Simple bandages, and apparatus embodying the feature of a special kidney pad. (2) Simple bandages act by supporting the entire contents of the abdomen, sustaining and more or less immobilizing the movable kidney or kidneys on top of the intestinal mass. (3) All the relief to be gotten from bandages in cases of movable kidney is obtainable from one of two devices, either from an elastic bandage, encircling and sustaining well the lower two-thirds of the abdomen, or from a long and low-reaching corset, fitted and adjusted with the same end in view. (4) The relief obtainable from bandages in any case of movable kidney will depend upon the presence and the degree of any associated enteroptosis. The greater the degree of associated general enteroptosis, the better the prospects of relief from a bandage or corset. When movable kidney exists without general enteroptosis, no form of apparatus will prove satisfactory. (5) All forms of apparatus with special kidney pads or trusses are to be absolutely rejected because they are impotent to fix and sustain a movable kidney, and because any pressure they may exercise is injurious to either the kidney or to neighboring organs, especially the vermiform appendix, or to both. (6) In all cases in which relief of symptoms cannot be obtained from either a proper simple bandage or corset, nephropexy is indicated."

F. Tilden Brown [3] relates an interesting case of **nonobstructive postoperative anuria.** The patient was one in whom the author had previously performed a nephrotomy for a large pyonephrotic left kidney. The patient improved somewhat after this operation, but the fistula began at times to close, with symptoms of absorption and painful overdisten-

[1] Am. Pract. and News, Mar., 1901. [2] N. Y. Med. Rec., May 4, 1901.
[3] Ann. of Surg., Mar., 1901.

tion. About a year after the operation the patient suffered from a severe attack of renal distention due to occlusion of the fistula. Prior to this nearly all of the urine coming from the bladder was found to be secreted by the right kidney and to be normal in character. A small amount of infected urine from the left kidney found its way into the bladder, but most of it passed through the fistula. At this time the patient showed some afternoon rise of temperature. It was determined that nephrectomy was the proper treatment, since the right kidney was in a healthy condition. The operation was performed, chloroform being used as the anesthetic. The kidney was large and typically pyonephrotic, with no tuberculous or calculous formations. Four hours after the operation the patient voided 3 ounces of urine which contained marked traces of albumin. Six hours after the operation 1 more ounce of urine was passed, which was the last during the remaining 48 hours of life. Every effort was made to encourage urinary secretion, but without success. At the autopsy the kidney showed some evidence of congestion and a few petechial spots, but otherwise was normal. The author discusses at great

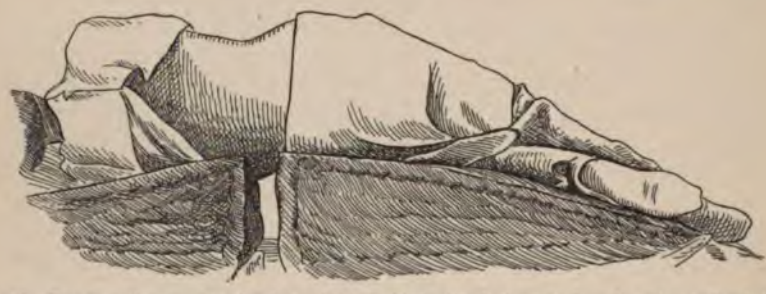


Fig. 52.—Postoperative anuria, showing a long double-inclined plane to flex the spine and minimize pressure upon the costal space (Brown, in Ann. of Surg., Mar., 1901).

length the possible cause of the anuria in this case. He thinks that death was probably due to that form of shock known as the erethistic type, in which reflex vasomotor paralysis so lowered the renal pressure as to produce a passive congestion and in this way cause the anuria. The patient's heart in this case was particularly weak, and the author thinks that it was largely responsible for the condition preceding death, and he urges that a sound heart is as necessary as a healthy kidney before performing the operation of nephrectomy. If the patient's heart condition had been appreciated prior to operation, the author asserts that he would have used ether or preferably nitrous oxid and ether instead of chloroform, as he thinks that the latter anesthetic added to the preexisting heart weakness. In such cases the combination of nitrous oxid and oxygen recently recommended may be of great use. He also, in discussing the causes of anuria, suggests the possibility of pressure upon the renal vessels of the healthy kidney by the position which the patient occupies upon the table. In order to avoid this pressure from the bags he has devised two pads which increase the space between the

pelvic brim and the last rib without making undue pressure upon the healthy kidney. (See illustration.)

Curtis,[1] before the New York Surgical Society, said that he had resorted to **incision of the capsule** in 2 cases of **postoperative anuria** and in neither case did any relief result, although it is possible the operations were delayed too long. In another case of the same kind 16 ounces of blood was removed from one of the veins of the arm and saline transfusion employed. In this case prompt relief followed the treatment. [The only remedy which we are persuaded is of value in postoperative anuria is infusion of warm salt solution into a vein. Other remedies should be regarded as adjuvants.]

Christian Fenger[2] discusses some **conservative operations for renal retention.** The technic of these operations is not as yet well-defined, for it has only been within the last 10 years that they have been performed. The author presents a table of 30 operations of a conservative kind done upon the ureter. In 26 out of the 30 cases reported the obstruction occurred at the exit of the ureter from the renal pelvis. From the operations described as conservative the author has excluded nephrotomy and drainage, nephropexy done to overcome a bend of the ureter, catheterization of the ureter from below, and cases of retention due to calculus. The first operation of which he speaks is that for cystonephrosis, which consists in a bisection of the kidney and a division of the partition walls between the distended sac and the pelvis, thus making a unilocular out of the multilocular cavity. But one such operation has been done, and that by the author, although various operations have been performed for obstruction at the exit of the ureter. The condition here found was always a valve-like formation from a unilateral dilation of the pelvis and consequent oblique insertion of the ureter at its exit. The methods of treating this condition are the transpelvic and the extrapelvic; the transpelvic is the oldest of the plastic operations done in this locality and was first accomplished by Trendelenburg in 1886. There have been 9 subsequent cases recorded as having been operated upon; 2 of the patients died, 1 of ileus and 1 from uremia in a case of bilateral disease. Resection of the ureter and reimplantation into the renal pelvis (ureteropyelonephrostomy, Küster) has been performed on 6 occasions. In 3 it was successful, in 1 it was followed by death from sepsis, and in 2 it was abandoned for nephrectomy. A longitudinal division of the ureter and stricture with transverse closure—that is, bringing the ends of the incision in apposition—has been done 11 times and none of the patients has died. In 1 case the operation was unsuccessful and was followed by nephrectomy. In the other 10 cases there was a successful functional result. Pyeloplication (Israel) has been done for a large distended pelvis in which the ureteral outlet was on the side instead of at the lowest portion of the pelvis. Excision of a part of the wall of the dilated pelvis has also been done (capitonnage of Albarran). Ureterolysorthosis, which consists in the loosening of adhesions around a bend in the ureter, has been re-

[1] Ann. of Surg., Mar., 1901.

[2] Ann. of Surg., Apr., 1901.

ported by Rafin. One case of Fenger illustrates the fact that an unsuccessful operation upon the ureter does not forbid a second attempt, as a second operation proved successful in establishing the patency of the ureter and saving the kidney. The author reaches the following conclusions: "(1) Choice of Operation: The choice of operation comes into question only in the cases of obstruction at the pelvic orifice of the ureter (unilateral implantation with or without stricture of the ureter at this point), and lies between transpelvic plastic operation, extrapelvic incision and plastic operation, and pyeloplication. Transpelvic plastic operation may be the operation of necessity in large cystonephrotic sacs because of the difficulty in reaching the ureter outside of the pelvis (in 9 cases, 2 were followed by obliteration). In smaller sacs with moderate dilation of the pelvis, I consider extrapelvic plastic operation preferable to transpelvic plastic operation and to resection and reimplantation of the ureter (ureteropyelonephrostomy). Resection was practised in 6 cases. In 2 the operation was incomplete and was followed by nephrectomy. It was successful in 3 cases and functionally successful in 1 (Bazy, No. 18). One patient died from iodoform-poisoning or sepsis. Thus it proved effective in all the 4 cases in which the operation was completed. Extrapelvic plastic operation was chosen by most of the operators. It was performed 11 times; it was successful in 10 cases with good functional results, and was unsuccessful in 1 case. It would thus seem that this should be the operation of choice by reason of the results obtained, and because its technic is relatively simple. (2) Danger to Life: The risk to life from this entire group of conservative operations for renal retention is small. Three of the 30 patients died, but in none of them was death due to the operation *per se*. In Trendelenburg's case the patient died from ileus, and both Helferich's and Bazy's patients had bilateral disease, and could not have been saved by nephrectomy. (3) Effect of the Operations: The results of the operations to reestablish evacuation of urine, and thus to save the kidney, were as follows: (*a*) Noneffective. The operation was noneffective in 5 cases, in 4 of which nephrectomy was performed (Van Hook, No. 5; Fenger, No. 20; Morris, No. 22; Fenger, No. 23), with no deaths. In 1 case (Gerster, No. 15) a urinary fistula returned. (*b*) Functionally effective. The operation was functionally effective in 22 of the 30 cases; that is to say, 22 out of 30 kidneys, or 75%, have been saved from nephrectomy. In a few of these cases a mucous fistula still remained at the time of publication, but an almost dry mucous fistula, leading probably to a suture or ligature, will close in time, and will never necessitate the removal of a kidney the urine from which passes into the bladder."

Willy Meyer[1] discusses **total extirpation of the ureter.** Primary removal of the entire ureter is rarely performed. If done it adds considerably to the risk connected with nephrectomy, since it requires more time and consequently a longer general anesthesia. The conditions which require total ureterectomy are tumor, primary tuberculosis, and exceptionally severe cases of suppuration. It is only in cases of malig-

[1] Med. News, Sept. 22, 1900.

nant tumor of the kidney that the removal of the entire ureter may become necessary, and even in these cases the operation is questionable, because if the ureter is primarily involved throughout its entire length the trouble will in almost every instance be beyond treatment. Meyer has operated upon 14 cases of renal tuberculosis, performing nephrectomy, and in none of these was it necessary to remove the entire ureter. Recently he has observed a case in which the greater part of the urine from the healthy kidney on the right side was discharged through a fistula in the left loin, where the ureter had been simply cut off after extirpation of the kidney. Since seeing this case it has been Meyer's custom invariably to cauterize the lumen of the remaining portion of the ureter and then tie it with catgut. In the case referred to the urine was able to make its way into the left ureter because of an ulcerative process about the ureteral mouth which had destroyed the valve of mucous membrane at this point. Primary total ureterectomy for tuberculosis is only rarely indicated. Kelly, Israel, and a few others have reported cases in which this operation was necessary. Meyer thinks that unless the ureter is extensively involved it may recover after the offending kidney is removed. In the majority of cases of primary renal tuberculosis the cystoscope shows the ureteral opening on the affected side to be ulcerated. These ulcerations heal if the kidney is removed at an early date. If the ulceration continues after an early nephrectomy, it would indicate that the tuberculous process in the ureter has no tendency to heal. Pressure upon the hypochondriac region during cystoscopy will not infrequently cause pus to flow from the ureter into the bladder. If these conditions are present, a second operation for the purpose of removing the ureter is indicated. Another indication for the removal of the ureter after nephrectomy is the establishment of a sinus after the nephrectomy wound has remained healed for some time. The case reported illustrates the third condition which requires ureterectomy, namely, "pyonephrosis and pyonephrotic stone kidney." The patient was a man 23 years of age, in whom a diagnosis of pyonephrosis was made, and it was thought that the condition was probably due to stone. At the operation the kidney was found to be large, the pelvis and the upper portion of the ureter dilated. The pelvis contained about 3 ounces of slightly turbid fluid. The kidney was incised, but no stone was found. When a flexible bougie was passed into the ureter, it met a firm but soft resistance about 6 or 8 inches below the pelvis. This stricture of the ureter was considered to be due to ulceration from a stone which had been impacted at this point and which had now become lodged lower down or had passed into the bladder. The parenchyma of the kidney appeared sufficiently healthy to render nephrectomy unwarrantable. When the patient had recovered, he was told that a resection with anastomosis of the ureter would have to be performed or else the kidney removed. The two operations were explained to him and he decided upon nephrectomy. This operation was done, the wound healed primarily, and the patient made a good recovery, but 15 months later suffered from pain in both lumbar regions, frequent turbidity

of urine, and general malaise. An examination of the urine from the two ureters by means of Harris's segregator and the use of the cystoscope caused Meyer to conclude that the patient was suffering from a suppurative process within the remaining portion of the ureter. The ureter was then removed throughout its entire length. It was found to be about the size of the thumb, was soft, and contained fluid. A tight stricture was present at the junction of the middle and lower thirds. When about to tie off the lower portion near the bladder, a stone about the size of a large pea was found firmly wedged in the ureter near its vesical orifice. The patient made a satisfactory recovery after operation. This case well illustrates the necessity of carefully testing the patency of the lower portion of the ureter when performing ureteroureterostomy for stricture. Meyer refers to another case in which he removed the entire ureter after nephrectomy had been performed. In this case there was an obstruction at the neck of the bladder, which prevented the use of the cystoscope and rendered diagnosis of the existing chronic suppurative ureteritis difficult.

Macdonald,[1] at the meeting of the Western Surgical and Gynecological Association, December 27, 1900, discussed the question of **injuries of the ureter** and reported an interesting case of rupture of this organ. Ureteral injuries may be separated into (1) those in which no open wound communicates with the injured organ; (2) penetrating wounds in which an open wound communicates with the ureter; (3) surgical wounds which are accidentally or intentionally inflicted. Macdonald details the symptoms, diagnosis, prognosis, and treatment of rupture of the ureter and reports the following interesting case: A girl 9 years of age was dragged in front of the runner of a heavily loaded sled. Excepting a bruise on the right side, examination revealed no injury and no hemorrhage from any internal organ occurred at any time. At first the patient suffered great pain, but 4 days later was discharged from the hospital. On the eighth day a tumor had developed below the twelfth rib on the right side. It fluctuated and was opened, 6 ounces of serous-looking fluid flowing out. This fluid became nearly solid when boiled. On the tenth day 8 ounces of similar fluid was withdrawn with a trocar and the cavity injected with a strong solution of iodin. On the twelfth day a free incision was made establishing drainage. The discharge upon examination proved to be urine. From this time until the performance of a thorough operation the daily flow of urine from the side was about the same as that from the bladder. The urine was slightly albuminous, urea was abundant, and microscopic examination showed blood and pus-cells. Three months after the accident Macdonald exposed the ureter and found it healthy for about 3 inches below the kidney. At this point sloughing had taken place, resulting in the destruction of several inches of the organ. A tedious and futile search was made to trace the lower portion of the ureter, during which the peritoneum was opened in three different places. Further dissection seemed useless and removal of the kidney was decided upon.

[1] Med. Rec., Jan. 12, 1901.

After this operation was performed the patient made an uninterrupted recovery.

Heaton [1] reports a case of **rupture of the kidney and liver** in which recovery followed nephrectomy. The patient was a young man who fell 8 feet, striking upon his side. A few hours after the fall he was admitted to the hospital suffering from the symptoms of severe hemorrhage, having passed large quantities of blood by the urethra. Abdominal section was performed 7 hours after the injury. The abdominal cavity was found to contain a large quantity of fluid blood which had escaped from a rent in the kidney and a less extensive laceration in the liver. The intravenous infusion of salt solution was twice employed during the operation. The kidney was so injured as to render its removal necessary. The laceration on the under surface of the liver was packed with iodoform gauze. For 5 days after operation the patient progressed well; at that time, however, he showed symptoms of uremia, which persisted until the seventeenth day, when a localized collection of bile and pus was tapped through an incision in the right loin. After this the patient made a good recovery. At the time of operation the patient's condition was so bad that a thorough cleansing of the peritoneum was not possible, and it is thought that the subsequent infection occurred through contamination of the clot from the divided ureter.

M. L. Harris [2] considers the question of **obtaining urine from the ureters.** But two methods are practicable, namely, ureteral catheterization and the use of the urine segregator. In order to catheterize the ureters successfully the urethra must be of sufficient size to permit the introduction of the instrument. The bladder must have a capacity of 120 to 150 cc. of fluid, and the fluid must remain transparent a sufficient length of time to permit the catheter to be introduced. Except in females, these conditions are requisite in the use of all ureterocystoscopes. The objections to catheterization are the variations in the bladder capacity; that it is not always possible to maintain a clear fluid in the bladder for sufficient length of time to permit a careful inspection of ureteral openings; that sometimes it is impossible to catheterize the ureter; that the catheter may become occluded; and lastly, that infection may be carried to a previously healthy ureter and kidney in spite of the greatest caution. Whether catheterization is to be employed or the urine segregator used, the bladder should be first injected with 50 to 60 cc. of a 5% solution of suprarenal extract, which is allowed to remain for 10 minutes. This is washed out and 15 to 20 cc. of a 2% solution of cocain injected and allowed to remain 6 minutes. When spasm of the bladder is present, Harris has found the following injection into the rectum to be of great advantage: Antipyrin, 1 gram; tr. opii, 1 cc.; water, 90 cc. The first two conditions named as necessary in catheterization of the ureters are also requisite in the use of the segregator. The third condition—that of transparency of the fluid—is unnecessary. Before using the segregator in men the prostate should be thoroughly massaged so that any pus which may exist in it may be removed. The

[1] Brit. Med. Jour., Oct. 13, 1900. [2] Ann. of Surg., Aug., 1900.

advantages claimed for the segregator are that it enables the surgeon to collect all the urine from each kidney without contamination; that the danger of infection of a healthy ureter or kidney is avoided; that it aids in a differential diagnosis of certain tumors of the abdomen; that it shows which kidney is diseased and gives the functional capacity of each; and that it also shows whether or not the bladder is involved.

Brown [1] considers the former theories regarding the **formation of renal calculi** unsatisfactory. He submits a number of cases which go to prove the more recently advanced theory of the **bacterial origin of renal calculi.** In each of the reported cases there was, previous to operation, a careful analysis made of the urine from each kidney, obtained by ureteral catheterization. Cultures were made from the urine thus obtained, and in all cases excepting one the urine from the supposed healthy kidney was found to be absolutely normal, while various cultures were obtained from the diseased side. The reaction of the urine from the infected side depended entirely upon the variety of microorganisms met with, being acid in 1 case, due to the colon bacillus, and alkaline in 5 cases in which there were found various microorganisms possessing an ability to decompose urea. In 5 instances, the urine being alkaline, nephrolithotomy was performed and the stone examined in each case. In 3 cases bacteria were found in the center of the calculus, while in 3 other cases the stones were not examined. In only 1 case was the urine acid, and here the microorganism found was Bacillus coli communis.

D'Antona,[2] in discussing **the indications for nephrectomy,** refers to the danger of leaving a patient with but one kidney. It is a fact, however, that a return of disease in a healthy kidney after the removal of its diseased fellow is very rare, and not infrequently the healthy kidney, being relieved from the danger of contamination from the diseased one, is less likely to become infected than it was before the operation. The author does not approve of ureteral catheterization. Even with the greatest care in disinfecting the bladder one cannot be sure that catheterization of the ureters may not result in infection of the healthy tube and kidney. It is thought, since the symptoms of kidney infection are insidious and delayed, that frequently it is not attributed to its true cause. In many cases the diseased products appear intermittently in the urine, and if at any time there is an interval during which pure urine is secreted, it goes to show that there is one healthy kidney. The absence of this intermittence, however, is of no diagnostic value. [We do not believe that there is great danger in carefully conducted ureteral catheterization, but undoubtedly there is some. D'Antona's objection is not apparently founded on personal ill results, as he records no cases to support it, and must be due to theory or the experiences of others. Undoubtedly hundreds of cases have been submitted to this operation without ill effect on the healthy organ. It is, nevertheless, true that the greatest care should always be exercised in rendering the bladder and its contents aseptic before resorting to ureteral catheterization.]

[1] Jour. Am. Med. Assoc., May 18, 1901. [2] Il Policlinico, Oct. 15, 1900.

F. Tilden Brown [1] discussed before the Surgical Section of the Suffolk District Medical Society the **diagnosis and surgical treatment of renal tuberculosis** and reported briefly a number of interesting cases. The treatment of this condition consists in local surgical treatment and climatic change. Neither surgical treatment alone nor climatic change alone can be depended upon entirely. Unfortunately, the diagnosis of renal tuberculosis is usually made late, and hence surgeons should be careful in every case of pyelitis, nephritis, or cystitis to seek diligently for the etiologic factor. The disease, in order to be treated successfully, must be detected before the objective symptoms have become so conspicuous as to render differentiation of the urines difficult and to indicate so extensive an involvement of other parts of the urinary tract as to preclude radical operation. The most careful and early search for tubercle bacilli should be instituted. Pains should be taken to exclude the smegma bacillus, which so closely resembles the tubercle bacillus, by obtaining the urine through a catheter. If tubercle bacilli should be discovered, careful inspection of the bladder should be made and ureteral catheterization employed in order to locate the seat of disease. Not unusually tubercle bacilli cannot be found in the urine even after careful search when an open tuberculous lesion is present. In such cases animal inoculation should always be employed. One of the earliest symptoms is a dull pain in the lumbar region. Should this pain be more acute and referable to the kidney or ureter, it is even more significant. Many cases give a history of having had systematic manifestations resembling mild malaria. Commonly, however, patients will state that they have had no trouble until frequent micturition developed, and not infrequently they will assert that this symptom has been of an intermittent character and that each recurrence is more persistent than the last. In the majority of cases frequency of urination does not appear until the lower segment of the ureter has either acquired a genuine tuberculous lesion or at least has become markedly hyperemic, with occasionally an irritation about the mouth of the ureter. The principal objective symptoms are a large and tender kidney, any one of the grades of pyuria and hematuria, a marked diurnal variation in temperature, loss of color and weight, a reaction to tuberculin, and the presence of tubercle bacilli in the urine obtained from the ureter. Since search for the tubercle bacillus is sometimes negative in cases of renal tuberculosis, the value of the injection of tuberculin becomes of importance. This applies particularly to those cases in which the temperature is nearly normal. Tube cultures should be made in all cases in which ureteral catheterization is employed in order to discover whether or not other pathogenic microorganisms are present. The mortality following nephrectomy for renal tuberculosis is surprisingly low. This fact, however, should not make us less careful in our investigations to discover whether the kidney which is to be left is perfectly healthy. The postoperative symptom which gives the most concern is that of persistent and exhausting vomiting. The greatest care should be taken in the preparation of

[1] Boston M. and S. Jour., May 30, 1901.

the patient for operation. When the heart is undoubtedly sound, chloroform should be employed; otherwise, nitrous oxid and ether. Brown is not prepared to recommend the removal of the entire ureter with the kidney where the disease is found to extend in this organ below the first sacral vertebra. He thinks that in many cases this infection of the ureter can be cured after the kidney is removed. He suggests that in cases in which it is undoubtedly true that the ureter is diseased from kidney to bladder it might improve the patient's chances if a primary ureterectomy of the lower half of the ureter were done while the proximal end was given a temporary cutaneous implantation until a later date, when it and the kidney may be removed. Even those cases presenting tuberculous vesical lesions and only one diseased kidney should be submitted to nephrectomy. Before attempting to relieve vesical tuberculosis proper care should be taken to determine the condition of each kidney, because no improvement will follow operation upon the bladder so long as any tuberculous debris is coming from above. Often it is difficult to ascertain the exact condition of the kidneys when the bladder is the seat of marked tuberculous disease, and in such cases the epicystotomy done for drainage should be utilized to catheterize the ureters. Artificial illumination in such an operation is almost indispensable. In discussing Brown's paper, Cabot expressed hearty cooperation with the views of the writer. He calls attention to the fact that the disease will usually attack one kidney first and that for a considerable time it is confined to one organ. The variations frequently observed in the size of the kidney, increase alternating with decrease, are probably due to the emptying of a tuberculous focus into the pelvis. When a kidney behaves in this way, Cabot thinks it significant of the condition under discussion and a marked indication for operation. Too much dependence should not be placed upon the absence of tubercle bacilli in the urine. The tuberculin test is an extremely valuable one when tubercle bacilli are not found after a careful search. In cases of doubt an exploratory incision should be made. Cabot employs Harris's segregator before resorting to ureteral catheterization.

Samuel Alexander,[1] in presenting some remarks on the **pathology and surgical treatment of urinary and urogenital tuberculosis,** says that tuberculosis in this region does not differ from that in other organs of the body, except that it is more frequently complicated by some other form of infection which may antedate the invasion by the tubercle bacillus or follow it. This double infection weakens the resistance of the tissues, intensifies the symptoms of the tuberculous process, obscures the diagnosis, and often renders treatment much more difficult. It is stated positively that primary tuberculous infection of the urogenital tract does occur. Of course, it is possible that the primary infection may not have been in the urogenital tract, but may have taken place in some other part of the organism, such as the pulmonary lymph-nodes; but if this is true, the primary lesion is often so slight as to escape detection. Alexander believes it possible for infection by the

[1] Med. News, Oct. 20, 1900.

tubercle bacillus to be introduced into the urethra and establish an ascending tuberculosis of the urinary tract. Primary tuberculosis of the urogenital tract is considered to be of hemic origin. Tuberculous infection of the kidney usually starts in the renal pelvis and not in the substance of the kidney. While it is possible that tuberculosis of the bladder may occur as a primary lesion, clinical data are wanting to confirm such a possibility. Tuberculosis of the bladder seems almost certain to be a condition secondary to a similar lesion of the kidney. In order that a tuberculous lesion may become established it is necessary that there exist a weakened cellular resistance of the tissues in addition to the introduction of the tubercle bacillus. The ability of the tissues to resist infection also plays a large part in the chances of cure after an operation. The prognosis is also influenced by the ability of the patient to improve his general health by suitable environment after operation. Great stress is laid upon the necessity of early diagnosis in these cases, since early treatment gives the best results. Many cases of well-established tuberculosis of the urinary tract are treated for a great length of time as cases of cystitis or prostatitis. The instrumentation which these cases are frequently subjected to contributes materially to the extension of the tuberculous process. In all cases of chronic inflammatory urinary disease in which the nature of the disease is not perfectly clear the urine should be frequently and carefully examined for the presence of tubercle bacilli. This examination should be most conscientiously and thoroughly employed. Direct inspection of the bladder and ureters by means of the cystoscope is of the greatest value. Ureteral catheterization should only be practised by an experienced surgeon. "Operations for tuberculosis of the kidney may be divided into three classes: (1) Operations in those cases in which the kidney is primarily affected and in which the diagnosis of urinary tuberculosis has been made while the infection is purely bacillary; (2) operations in cases in which the tuberculosis is primarily in the kidney and in which there is a mixed infection, but without tuberculous disease in any other portion of the urinary tract; (3) those cases of advanced tuberculosis of the kidney with secondary tuberculosis of other portions of the urinary tract. I believe that in all cases of tuberculosis of the kidney in which an operation is not absolutely contraindicated by the general condition of the patient, surgical interference is not only justifiable, but is imperatively demanded. The results of operation, however, will vary within very wide limits, and at the present time it is impossible to generalize in regard to the prognosis of any of the three classes of cases mentioned above. As a general rule, when operation upon the kidney for tuberculosis is indicated, the choice should be given to nephrectomy. Recent statistics show that the immediate mortality of nephrectomy and nephrotomy is about equal, but the remote results are greatly in favor of nephrectomy."

Vineberg [1] reports a case of **nephrectomy for ascending tuberculosis** and discusses at length the use of the cystoscope and the catheterization of the ureters in women.

[1] N. Y. Med. Jour., Sept. 1, 1900.

Pousson,[1] in a discussion of the **value of surgical intervention in renal tuberculosis,** before the Thirteenth International Congress of Medicine, concludes as follows: "(1) *General Results:* Immediate Results: (*a*) In 600 cases the mortality was 22.33%. In the 161 cases which he had recently collected the mortality fell to 11.68% and in the practice of some surgeons it had further dropped to 8.95%. (*b*) The operative mortality respectively of nephrotomy and nephrectomy was, taking all the cases together, nearly equal—namely, 20.8%, as against 21.47%. In the personal statistics of certain surgeons, however, incision of the kidney was more deadly than its extirpation in the proportion of 18.51% to 6.54%. (*c*) The causes of death after either operation were suppression or deficiency of the urinary secretion. This occurred in 51 deaths out of 128. Other causes of death were shock, peritonitis, and injuries to other viscera or important vessels. Secondary Results: Of 63 persons operated upon by nephrotomy, 39 died in the following year from progressive tuberculosis or other causes due to incomplete operation, and 24 were alive, of whom some were known to be living after the lapse of 3, 5, and even 10 years. All these patients, however, had lumbar fistulas. Of 335 patients operated upon by nephrectomy, 42 died within the year from diffuse tuberculosis and 295 others were living, as follows: At the end of 1 year, 33; from 2 to 3 years, 41; at the end of 5 years, 4; at the end of 6 years, 7; at the end of 8 years, 2; and 7 out of 105 had a fistula. (2) *Results in the Different Forms and Clinical Circumstances of the Disease:* Indications and Contraindications: (*a*) Of 10 patients operated upon for pain or hemorrhage in the purely bacillary stage, none died. The patients lived for a long time afterward and preserved an actively working urinary apparatus. Intervention, then, having for this aim the removal of a quiet bacillary focus, was undoubtedly legitimate. (*b*) In mixed infections the results were not so good. (*c*) Bilateral cases of lesion might be operated upon except when the other kidney showed very definite bacillary infection. A slight nephritis was no bar to either nephrotomy or nephrectomy. (*d*) As to the bladder, the reflex pains of this organ often disappeared after operation. (*e*) The condition of the lungs and other organs and the age and sex of the patient have the same bearing upon these operations as upon any other. (3) *Results Following upon Different Methods of Operation:* Choice of Methods: (*a*) Nephrotomy should not be employed in the nodular or miliary form of tuberculosis. In the hydronephrotic form it should be always employed. So far it had been almost exclusively employed in the pyelonephrotic form, but, as a rule, only gave temporary results and even when most successful was followed by a fistula. (*b*) Primary nephrectomy was the operation of election; its mortality was only 21.79%; whereas that of secondary nephrectomy was 30.76%. The latter operation was, however, of considerable service. (*c*) With regard to the relative merits of the extraperitoneal and transperitoneal routes, the former with a mortality of 21.2% was far preferable to the latter with a mortality of 34.04%. (*d*) Partial nephrectomy should be altogether discarded."

[1] Lancet, Aug. 11, 1900.

DISEASES OF THE PENIS, URETHRA, TESTICLE, ETC.

W. T. Baird [1] describes a **new phimosis forceps.** Under cocain anesthesia the foreskin is slit up the back, the forceps applied to one-half of the prepuce, which is then amputated, and a catgut suture passed through the needle guides of the forceps on a straight needle. The forceps is now removed and applied to the remaining half of the foreskin, which is treated in a like manner. The concave borders of the blades do not meet when the forceps is clamped by about 3 millimeters, thus preventing pressure anemia. The convex borders are approximated tightly, so that when the forceps is removed all hemorrhage is stopped. An elastic protective dressing consisting of zinc oxid 2 grams, formalin 2 grams, gelatin 4 grams, glycerin 6 grams, and water 8 grams, is painted over the incision. This is removed in from 3 to 5 days by soaking in hot water, and if there be any unhealed points, it is reapplied for a few days longer. [The operation can be so rapidly

Fig. 53.—Baird's phimosis forceps.

and neatly performed with ordinary tools that it seems unnecessary to devise new ones.]

Albert N. Blodgett [2] reports a case of **preputial calculus** in a patient aged 22 years, whose foreskin was long and tightly constricted at the end. There was a pear-shaped swelling within the prepuce, from the opening of which issued a greenish puriform discharge. At operation a collar of calcareous material was found surrounding the corona and extending forward toward the meatus. According to the Index Catalogue, 24 cases have been reported.

L. Grounauer [3] reports a **webbed penis** in a child 7 years of age. The penis was attached to the scrotum and pointed directly downward, not only because of its connection to the scrotum, but also because the urethra was shortened. It was restored to its normal position by operation.

R. H. Russell [4] proposes a **new operation for hypospadias.** The objects of any operation for hypospadias are to so alter the penis as to make it an effectual organ and to enable the patient to urinate in the masculine fashion. The only method that has been attended with any considerable measure of success is the plan of Duplay, by which a glandular

[1] Phila. Med. Jour., Nov. 24, 1900. [2] Boston M. and S. Jour., June 21, 1900.
[3] Rev. Méd. de la Suisse Romande, July 20, 1900.
[4] Brit. Med. Jour., Nov. 17, 1900.

urethra not lined with mucous membrane is formed in the first stage, a penile canal from lateral flaps of the prepuce in the second stage, while at the third operation these urethras are joined. Russell's operation is best done in two sittings, and may be described by narrating the case he reports. A boy aged 9 years was subjected to operation. The penis was bound to the perineum and contained no vestige of urethra, which

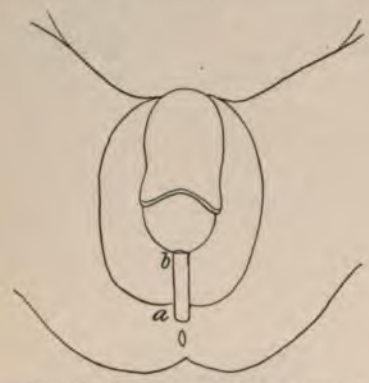


Fig. 54.—Russell's operation for hypospadias. While the urethra opens in the perineum at *a*, there is seen extending forward from the orifice for a short distance a sulcus (*a*, *b*) lined with mucous membrane (Brit. Med. Jour., Nov. 17, 1900).

Fig. 55.—Russell's operation for hypospadias (Brit. Med. Jour., Nov. 17, 1900).

tube opened on the perineum just below the point where the glans adhered. An incision was made through the frenum and around the penis, dividing the prepuce near the corona, and liberating the penis from the scrotum. The shaded portions in figure 55 show the raw surface exposed. A capacious channel was made through the glans by a tenotome and an incision (dotted lines *e'*, *e*, figures 55 and 56) carried from near the extremity of the perineal urethra, about $\frac{1}{3}$ inch from the cut margin of the skin, over the dorsum of the penis to a corresponding point on the opposite side, marking out a strip of skin which resembled a clergyman's stole. This loop of skin was then slipped over the end of the penis as a clergyman removes his stole and the end pulled through the channel in the glans by forceps, the redundant portion being cut off and the lateral flaps secured at the meatus with sutures, the cutaneous surfaces facing each other. The gap on the dorsum of the penis was closed by sutures, and on the under surface of the organ the prepuce was made to cover the two edges of the new urethra by including its edges in the sutures which united the edges of the new urethra (Fig. 57). At the second operation the urethra was separated from the perineal skin and the bladder drained by the suprapubic route. It is important to incise exactly at the point where the skin joins the urethra, as any particle of cuticle remaining

Fig. 56.—Russell's operation for hypospadias. Dorsal vein of penis after the incision *e*, *e'* has been made (Brit. Med. Jour., Nov. 17, 1900).

attached to the mucous membrane will lead to a fistula at that point. The perineal and new penile urethras fall together as the thighs are approximated and no sutures are required. In the case reported a small hole remains at the middle of the penile urethra, which gives no inconvenience during micturition as it is closed by pulling on the organ.

Ferd. C. Valentine [1] reports a case of **hypospadias operated on by Beck's method.** The urethra opened ½ inch behind the glans, which presented five paraurethral fistulas. The skin from the under surface of the lower two-thirds of the penis was reflected back in two lateral flaps and the urethra with the corpus spongiosum dissected from its bed. A channel was then made through the glans with a narrow bistoury and the end of the urethra drawn through this canal and sutured to the new meatus. The paraurethral fistulas were disregarded. The operation was completed by suturing the skin flaps in place.

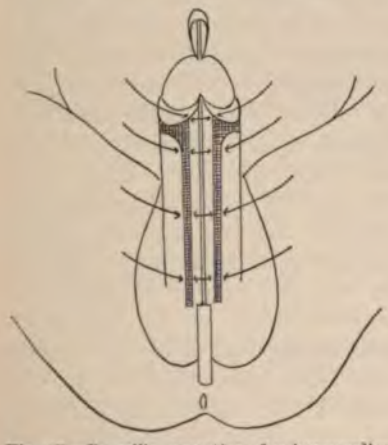


Fig. 57.—Russell's operation for hypospadias (Brit. Med. Jour., Nov. 17, 1900).

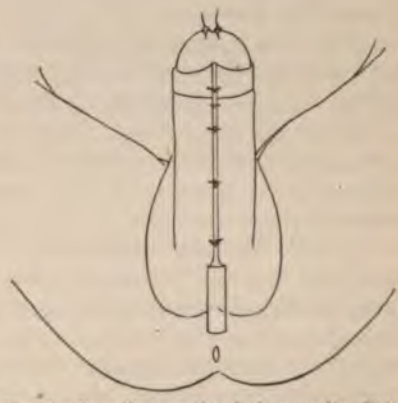


Fig. 58.—Russell's operation for hypospadias (Brit. Med. Jour., Nov. 17, 1900).

Beck [2] first demonstrated this operation October 4, 1897 ; 10 months later von Hacker announced this operation as his own, and Breveer subsequently performed the same operation, but afterward acknowledged Beck's priority.

C. H. Mayo [3] reviews the operative principles utilized for the cure of **hypospadias :** (1) Simple canalization ; (2) denudation and suture ; (3) the use of penile flaps ; (4) taking flaps from the abdomen or scrotum ; (5) combination of these fundamental methods ; and (6) mobilization and dislocation of the urethra. Hypospadias is one of the most common malformations of man, occurring, according to Rennes, Kaufman, and others, once in every 350 males. The causes of failure after operations are difficulty of sterilization, soaking of the dressings with urine, tension of small sutured flaps, straining of an irritable bladder owing to the presence of a catheter, the urine being forced out along-

[1] Med. Rec., July 28, 1900. [2] N. Y. med. Monatsschr., Nov., 1897.
[3] Jour. Am. Med. Assoc., Apr. 27, 1900.

side the instrument, frequent erections, and lack of persistence in submitting to frequent operations. Concerning the Beck operation, he says it is the best procedure for certain cases. In the 1899 report of the Heidelberg Clinic 3 cases treated by the Beck method are reported; in all the subsequent contraction of the stretched urethra curved the glans downward, so that the urine was delivered from below as previous to operation, thus giving theoretic but not practical relief. Ochsner precludes the formation of this downward curvation by locating the meatus above the apex of the glans. Four cases are reported. Case 1: A boy, aged 4 years; penile hypospadias operated upon by the Duplay method with partial success; later a good urethra was constructed by the Thiersch method. Case 2: An adult with balanic hypospadias secured an almost perfect result after two Thiersch operations. Case 3: A boy, aged 6, with the perineoscrotal variety was operated upon by constructing 2 inches of urethra from the prepuce and the skin of the dorsum of the penis, which was drawn through a tunnel in the penis and glans to meet the perineal urethra. The bladder was drained through a Nelaton catheter in the perineum, but union of the urethras failed. Later the bladder was drained for 8 days by a Jacob's self-retaining female catheter in the perineum, and the urethra was drained by silkworm-gut. Cure followed. Case 4: A boy, aged 8, with the penile-scrotal type, had 1¾ inches of urethra constructed, as in case 3, and the bladder drained by the Jacob's catheter; the two urethras were united and a complete cure followed.

F. W. Parham contributes to the "New Orleans Medical and Surgical Journal," January, 1901, a lengthy article on the **operative treatment of epispadias and hypospadias,** reviewing the history and discussing the various methods that have been proposed for the relief of these conditions. He mentions Beck [1] as having extended his operation to include even some degrees of penile hypospadias. He reports a case of complete epispadias, the meatus opening just under the pubic arch, which was operated upon by the Cantwell method. A forceps was introduced into the bladder through the abnormal meatus and made to bulge in the perineum. An incision was then carried down to the point of the forceps and a soft rubber catheter placed in the bladder. Next the urethra was dissected out almost to the bladder, and when extended reached nearly to the normal situation of the meatus. The urethra, which resembled an open alligator mouth, was converted into a closed tube by stitching the lateral slits. The corpora cavernosa were separated by blunt dissection and the glans partially split to form a new meatus. Finally the urethra was drawn down between the corpora cavernosa and sutured to the under side of the penis and the cavernous bodies stitched in place. The patient can retain his urine 2 hours. The meatus has been pulled backward by the contracting urethra, so that the case is now one of postbalanic hypospadias.

Orville Horwitz [2] reports a case of **urethrorectal fistula cured**

[1] N. Y. Med. Jour., Dec. 8, 1900. [2] Phila. Med. Jour., Jan. 12, 1901.

after a third operation. The patient, aged 22, developed, during an attack of posterior urethritis, an abscess connected with the membranous urethra, which ruptured into the rectum, establishing a fistula. The rectal orifice of the fistula was about 1½ inches within the sphincter ani. As soon as urine to the amount of an ounce accumulated in the rectum, dribbling would take place, thus indicating that in cases of exstrophy of the bladder in which implantation of the ureters into some portion of the intestinal canal may be desired, the sigmoid would be the point of election. Flatus occasionally was passed by urethra, but feces never. This was accounted for by the direction of the fistula and by the fact that the urethral end of the fistula was much smaller than the rectal opening. At the first operation a bougie was passed into the urethra and a transverse incision made in the perineum in front of the anus. The rectum was separated as far as the abnormal opening, which was closed by silk sutures, and the membranous urethra opened by a median perineal cut, with the idea of freshening the edges of the fistulous opening in the urethra. Continuous drainage was established by a catheter introduced through the penile urethra and the perineal wound was packed with iodoform gauze. On the fifth day after operation the catheter became displaced, and during the maneuvers for its reintroduction the nurse reopened the tract into the bowel. Later the bladder was drained by a suprapubic cystotomy and the opening into the rectum seared with the thermocautery. For 10 days no urine dribbled from the rectum, but unfortunately a small abscess developed and the sinus was reestablished. Finally, after dilating the sphincter ani, the anterior wall of the rectum was drawn down by forceps and the margins of the fistulous opening, together with the mucous membrane for ¼ inch surrounding the orifice, were denuded, and five silkworm-gut sutures introduced. By means of a Pennington hollow rectal tampon the wound was protected, spasm of the sphincter prevented, and drainage of the rectum secured. The bowels were allowed to move on the seventh day, the stitches were removed on the eighth day, and the bladder was drained for 3 weeks. Recovery was complete and permanent.

C. M. Ellis, in a letter to the "Philadelphia Medical Journal," October 20, 1900, writes of a case in which a **hat-pin became embedded in the urethra.** The patient had used it to facilitate micturition, which was delayed because of an enlarged prostate. The point of the pin, which could be felt just behind the attachment of the scrotum, was made to penetrate the urethra until the head was reached, when the pin was reversed, and the head pushed along to the meatus. The minute puncture in the urethra gave no subsequent trouble.

P. J. Kress [1] narrates a case of **hat-pin in the urethra.** The head of the pin slipped into the bladder and the point embedded itself in the wall of the urethra about 1 inch from the meatus. It was removed through an incision.

W. L. Brown [2] publishes a case of **hat-pin in the urethra.** The head was in the bladder and the point lodged in the urethra behind the

[1] Phila. Med. Jour., Jan. 19, 1901. [2] N. Y. Med. Jour., July 7, 1900.

scrotum. A cut ½ inch long was made at the base of the scrotum and the foreign body removed. The incision was closed by two silkworm-gut sutures, primary union resulting.

Joseph B. Bissell [1] gives the history of a case of **extravasation of urine following a stricture of large caliber.** The patient, aged 41 years, was sent to the hospital with a diagnosis of enteric fever or malaria. Notwithstanding the presence of urinary extravasation in the perineum, scrotum, and over the abdomen and loins, he passed urine normally and a catheter could readily be introduced into the bladder. About 4½ inches from the meatus a stricture of a caliber of 24 or 25 French was found. An external urethrotomy revealed an opening in the urethra just behind the penoscrotal juncture. Death occurred at the end of 36 hours. The author says this accident not infrequently follows stricture of large caliber, a progressive ulceration forming behind the constriction.

A. V. Moschowitz,[2] in a paper on the **radical treatment of tuberculosis of the testicle,** says it has not been definitely decided whether primary tuberculosis of the genital tract exists or not. However, patients in whom no other focus of infection can be found often present themselves with a tubercular nodule in the epididymis. The danger of such a nodule is infection of the entire genitourinary tract, the bacilli traveling up the vas deferens. With the possibility of such an extension in view, the author advises the excision of the entire vas deferens together with the testicle, as simple castration would often take but part of the disease away. Castration should be performed through an inguinoscrotal incision and the vas deferens cut off as high as possible after making traction on it and isolating it from the rest of the cord. The cut end is ligatured and seared with the cautery. The patient is then placed in the lithotomy posture, a sound introduced into the bladder, and a curved incision in front of the anus made from one ischial tuberosity to the other. The perineal fascia, the tendinous union between the bulbocavernous muscle and the external sphincter, and the anterior portion of the levator ani are divided, and the prostate and seminal vesicles palpated. A finger hooked above the prostate through the rectum will facilitate the delivery of the vesicle. By gentle traction the entire vesicle and intra-abdominal portion of the vas are brought into view; the ejaculatory duct is severed, and the perineal wound packed with gauze. The writer has operated on one case by this method, excepting that the epididymis and not the testicle was resected.

O. Lauz [3] concludes that resection of the epididymis is much less safe than castration in **tuberculosis of the testicle.** He cites 2 cases, in one of which cure followed resection of the epididymis, and in the other the testicle was found to be microscopically, but not macroscopically, involved after castration.

J. B. Murphy [4] contributes an exhaustive article on **tuberculosis of the testicle, with special consideration of its conservative treat-**

[1] Med. Rec., July 28, 1900.
[2] Med. Rec., Sept. 15, 1900.
[3] Deut. Zeit. f. Chir., Bd. LV, H. 5 u. 6.
[4] Jour. Am. Med. Assoc., Nov. 10, 1900.

ment. After describing the anatomy of the testicle, he says the functions of the organ are the production of spermatozoa and the formation of an internal secretion which is necessary to normal metabolism. He directs attention to the experiments of Zath, who found that a man's neuromuscular power was increased 5% during work, and that during rest his powers of recuperation were greatly strengthened by the injection of testicular extract. And not only is the general metabolism affected by castration, but grave mental states are apt to arise. Many patients will not consent to castration unless they are convinced that life is in jeopardy. Tuberculosis of the testicle is most frequent between the twentieth and thirty-fifth years, when the activity of the gland is at its height. It may, however, occur at any age. Julien reported 16 in infants, 6 of which were under 1 year of age, and Dreschfeld cites a congenital case; Gibson reports a case occurring in a man aged 81. In the cases reported by Murphy, 13 in number, the average age was 33 years. An inherited tendency is well demonstrated in those cases which develop soon after birth. In the majority of those occurring in adult life no tubercular family history can be obtained. Many are preceded by trauma, sometimes so trivial as to have been scarcely noticed by the patient, and in others so striking and direct that no room for doubt is left. The disease does not usually manifest itself until 6 weeks after the injury has been received. Gonorrheal epididymitis and posterior urethritis are by far the most important predisposing factors; they preceded 14 of the 52 cases collected by Kocher. Shaw records a case which followed measles. Infection takes place through the respiratory system, the alimentary canal, the genitourinary tract, and the skin, in the order of frequency as cited. Murphy believes that the mediastinal glands are the usual sources of supply for tubercle bacilli in the body. Bugge asserts that 75% of all patients coming to autopsy have had tubercular adenitis of the mediastinum. The bacilli are carried to the testicle by the blood or lymph, or travel along the mucous membrane of the genitourinary tract. Transmission by the blood is considered the most important, and the frequent localization of the bacilli in the epididymis is accounted for by the fact that the spermatic artery divides opposite that structure and that the arterioles in the epididymis are narrower and more tortuous than either those in the testicle or in the vas, the current being consequently much slower. Transmission by the lymph stream must be very rare, as the current flows from, and not to, the testicle. While the infection may travel along the mucous membrane from above downward, the author thinks that the epididymis is generally first involved and that the process then extends up along the vas and secondarily affects the prostate, etc. Tubercular disease of the testicle is infrequently associated with involvement of the lungs, bones, or lymphatic glands. In children the peritoneum may be affected through the processus vaginalis. In the majority of the writer's cases the disease began in the epididymis. Koenig claims that the testicles are rarely affected in general miliary tuberculosis. No authentic case of tuberculosis in an undescended testicle is on record. Inversiotestis oc-

curred in 5 of Koenig's cases and in 1 of Murphy's. In the majority of cases the right testicle suffers first; 8 out of 10 in Murphy's series. Although most authorities hold that the globus major is first attacked, Murphy's observations lead him to state that the globus minor is most frequently primarily affected in adults and the globus major in children. The spermatic cord is involved in a considerable number of cases, but not throughout its length, one or both ends being thickened and nodular. The seminal vesicles and the prostate follow in the order of frequency of involvement; the former may be infiltrated in some instances even with a healthy vas. As the infection is carried by the blood stream, it is supposed that the bacilli first lodge in the intertubular connective tissue and there set up a specific irritation. In the early stages of the process the micro-organisms may be demonstrated in the sections, but after caseation has taken place they may be so few in number as to escape the most careful examination. Concerning the symptoms, it is said that when the condition is complicated with infection by other organisms, the course may be so acute that it resembles gonorrheal epididymis. Most of the patients present themselves with a nodule which is painless and slightly tender at first and which afterward becomes the seat of a dull, aching pain, made worse by exercise. A whitish urethral discharge or a discharge containing blood or pus may appear. It disappears after castration or epididymectomy. Irritability of the bladder is a common symptom. Hydrocele, which is rarely large, is present in about one-third of the cases. Constitutional symptoms are present in the majority of the patients: loss of weight and strength, slight evening fever, and night sweats. A finger should always be inserted into the rectum to ascertain the condition of the prostate and seminal vesicles. The lymphatic glands of the groin are seldom enlarged. Bacilli can usually be found in the pus, obtained by centrifugating the urine, although always in small numbers. Extension by the lymphatics is rare. Tubercular spondylitis has often been noted to follow testicular tuberculosis. Miliary tuberculosis occasionally develops. Parallel columns giving the differential points between tubercular epididymis and gonorrheal epididymitis, between tuberculosis of the testicle, syphilis of the testicle, and malignant disease of the testicle are found under the chapter on diagnosis. The prognosis in children is favorable, as the focus usually becomes encapsulated. In adults the prognosis depends on the complications, such as sinuses of the scrotum, involvement of the seminal vesicles, prostate, and bladder (rare), or the presence of foci in other portions of the body. Murphy argues that the prognosis is favorable even though the prostate and seminal vesicle are involved, the disease of these parts subsiding after removal of the testicle or epididymis. When the infection once reaches the bladder the outlook becomes very grave, the patient usually dying of renal or miliary tuberculosis. The general health may remain unaffected even when both testicles are invaded and sinuses are present. In infants the nutrition should be increased, but no operation should be performed unless suppuration occur, when incision and drainage are indicated. Iodoform and zinc injections should have no place in the treat-

ment. Mauclaire's method—excision of a portion of the spermatic cord between ligatures—does not seem rational and has not been employed often enough to determine its position in the treatment of this disease. Castration is not justifiable when the epididymis or only a portion of the testicle is involved, even though the seminal vesicle be diseased. Curetage with drainage is followed by protracted suppuration and final destruction of the organ; it has many disadvantages and no advantages over epididymectomy. Epididymectomy is contraindicated when foci in other parts of the body will surely terminate life in a short time. When the scrotum is riddled with sinuses and the testicle is extensively infiltrated, castration is indicated. In all other cases resection of the epididymis is the operation of choice because it removes all the diseased tissue; it does not remove the testicle, thus preserving the internal secretion, sexual desire, and potency; it has the same effect on the vesical symptoms as orchidectomy; the operation is easy to perform and is devoid of danger; convalescence is rapid and the good results permanent; and because patients will early consent to the operation, thus avoiding further infection. The chief objections which have been lodged against this operation are that it is not radical, as the rete testis is involved even when it appears normal to the naked eye; that, as sterility will follow either castration or excision of the epididymis, it is unwise to risk the possibility of leaving infected tissue; and that atrophy of the testicle follows. To the first objection Murphy replies that practically it is radical, and that when the rete testis is involved to such an extent as to give further trouble, it is possible to determine this fact macroscopically and it may be excised with the epididymis. The second objection is made by those who do not recognize the importance of the internal secretion of the testicle; after epididymectomy the patient is sterile, but not impotent; after castration he is both. He answers the third objection by saying that it is not founded on fact; that numerous observations and experiments have demonstrated beyond doubt that when the operation is correctly performed the vessels are not disturbed and that atrophy does not take place. The steps of the operation are as follows: Incision into the tunica vaginalis; separation of the epididymis from the testicle by blunt dissection, hugging the epididymis so as to avoid the spermatic vessels; if a focus is discovered in the mediastinum, it is to be excised by a wedge-shaped incision and the defect closed with catgut sutures; isolation of the vas as far as the internal ring, where it is divided, the mucous membrane of the proximal end cauterized for ½ inch with 95% carbolic acid, and a ligature of chromicized catgut placed ¼ inch from the severed end; reposition of the testicle, insertion of a gauze drain for 48 hours, and suture of the skin.

Kayser [1] analyzes 21 cases of **sarcoma of the testicle.** Trauma preceded the disease in 7; 19 patients have thus far perished. The condition appears to develop during the period of sexual activity. In some cases sclerosis of the organ was noticed for several years before the tumor became apparent. The growth was often painless, usually

[1] Mittheilungen aus den Hamburgischen Staatskrankenanstalten, Bd. XI.

unilateral, and generally accompanied by effusion into the tunica vaginalis. Extension is effected not only through the blood stream, but also through the lymphatics, as in 7 of the cases the retroperitoneal glands were involved.

T. Annandale [1] states that **misplaced testicle** is uncommon. It may be situated on one side of the perineum, in front of the pubes, or in the region of the saphenous opening. When not in the scrotum the testicle degenerates and becomes functionless; it may become inflamed or cause trouble in connection with hernia. He referred to a child of 3 years on which he had operated by placing a perineal testicle in the scrotum and holding it in position by catgut sutures. If the cord be too short, it may be lengthened by gentle traction and by severing the cremasteric fibers. The testicle should be given a chance to develop by fixing it in the scrotum in early childhood. In adults he invariably removes the organ if encountered during a hernia operation. He reports 2 cases of **congenital deficiency of the testicle,** 1 in a patient aged 18 and 1 in a man aged 26. In each the vas deferens was well developed and ended in a closed extremity at the end of a soft body, which contained no trace of testicular substance.

M. Parizeau [2] reports a case of **dislocation of the testicle** under the skin of the penis following a crushing accident. It was replaced and fixed in the scrotum some 2 weeks later. There are 2 other cases on record; in one the testicle passed through the septum of the scrotum and in the second it passed up under the pubic skin.

G. R. Turner [3] describes a case of **supernumerary testis** in a child 3½ years old. Appended to the right cord were three masses; the upper proved to be an encysted hydrocele and the lower two testicles. The lower and larger one was in the usual position of the testicle and its tunic was the seat of a hydrocele. The upper testicle had a separate tunica vaginalis and a separate cord. Lane has reported a case almost identical with the one above described. Microscopic examination of Lane's case showed well-formed tubules with spermatogenesis proceeding, the patient being 17 years of age. In both the cases related the supernumerary organ was probably a developmental subdivision of the larger organ on the same side.

George A. Peters [4] insists on the early recognition of **tubercular disease of the testicle.** If the infection has extended to the bladder, operative cure is out of the question. The surgeon should aim to remove all of the infected tissue just as if the case were one of carcinoma. Failure to remove every atom of the disease, however, is much less disastrous than in cancer, the resistance of the tissues sometimes overcoming the remnants of the disease after partial ablation. The importance of fresh air, good food, etc., should not be overlooked. Peters believes that the prostate and seminal vesicles should be examined in all cases, and that if they are diseased, the testicle, vas deferens, and seminal vesicle should be removed in the following manner: After

[1] Lancet, Nov. 17, 1900.
[2] Union Méd. du Canada, Feb., 1901.
[3] Lancet, July 21, 1900.
[4] Canadian Pract. and Rev., Aug., 1900.

separating the testicle from the cord, the vas is freed well up into the inguinal canal, severed, and the end seared with carbolic acid and allowed to retract. The scrotal incision is then closed and the patient placed in the lithotomy position. An incision about 4 inches long situated about 1 inch to the right of the median raphe is made from the front of the perineum to the level of the coccyx. The transverse perineal muscle and artery are too far in front to be injured, and the internal pudic is out of harm's way, but the danger of wounding the rectum should always be kept in mind. No more of the levator ani than is absolutely necessary should be divided. The identification of the vesicle is facilitated by slowly distending the bladder with boric acid solution, but it should be remembered that a full bladder is much more liable to injury than an empty one. The fascia investing the vesicle must be freely divided before it can be shelled out. Next the vas is sought for, carefully separated from its environing fascia, and drawn down from the inguinal canal through the pelvis. The common duct is now divided and the vesicle and vas removed entire. The right vesicle and vas may be excised through the same incision. Any tubercular nodules in the prostate are enucleated, or if they have broken down they may be scraped away and the cavity swabbed with pure carbolic acid. If caseating or suppurating areas have not been opened, the wound may be closed with deep sutures, with the hope of obtaining primary union.

Dudley Tait [1] advises **eversion of the tunica vaginalis** as a remedy **for hydrocele.** The injection methods are unsurgical and unsatisfactory; Volkmann's procedure, consisting of marsupialization of the sac, gives 10% to 15% of recurrences; and Block's method, which is identical with Volkmann's, excepting the swabbing of the sac with a 3% solution of carbolic acid, is accompanied by 5% of recurrences. Total excision of the sac is objected to because of its severity. Although this operation is supposed to have been originated by von Bergmann, it was performed by many ancient surgeons. In sclerosed, calcareous, or tubercular conditions it may be of great value. The operation of eversion was probably first done by Vautrin, of Nancy. Doyen performed the operation as early as 1891. "Under local or general anesthesia an incision is made down to the serofibrous layer. The length of the incision varies necessarily with the dimensions and position of the hydrocele. The tumor, still unopened, is then dissected by means of gauze or the finger, until the mass is free from the cellular layer, especially posteriorly. All bleeding must be checked at this stage by hemostatics or ligatures. A long incision is then made in the sac from which the fluid escapes. The tunica is then turned inside out, placing the endothelial surface outward, and securing the cut edges of the serosa as high as possible around the cord by means of two or three catgut sutures. The testicle is then replaced in its normal position. It is covered by the skin, dartos, and cellular tissue. Suture of the skin without drainage completes the operation, which requires generally from 5 to 10

[1] Ann. of Surg., Mar., 1901.

minutes. A very mild local reaction, and, exceptionally, some tenderness over the testicle, may be noted during the first 2 or 3 days." Tait simplifies this operation by inverting all the layers *en masse*. Although an independent conception, this modification had already been put in use by Longuet in 22 cases. After cutting into the hydrocele and turning the testicle out, a new bed is made for the testicle in the cellular tissue at the middle of the inner lip of the incision. One or two sutures are taken to secure the tunica vaginalis in its new position. The position of the testicle is that of retrolateroversion. The incision in the skin is closed with two or three sutures, and the patient may resume his work the next day. There have been no recurrences thus far.

Orville Horwitz [1] states that at present there are five different methods commonly used for the radical cure of **hydrocele**: (1) Acupuncture (for infantile hydrocele); (2) tapping and injecting irritating substances; (3) antiseptic incision; (4) partial excision of the sac; (5) inversion of the sac. He mentions a case of spontaneous disappearance of hydrocele. Spontaneous cure is rare, but sometimes follows inflammatory conditions of the scrotum and testicle; cures following gout and smallpox have been recorded. Horwitz analyzes 338 of his operations. All ages are represented. There were no deaths. Of 34 infants operated upon by acupuncture, or the "needle operation," there was recurrence in 9, and they were operated upon by antiseptic incision; 2 of these again recurred, and part of the sac was resected in each and cure effected. Of 34 adults operated upon by antiseptic incision, 9 had recurrence; its employment should be limited to small recent hydroceles with thin sacs. In the needle operation it was found necessary to perform acupuncture from 4 to 6 times, at intervals of 1 week, until a cure was secured. Of 94 partial excisions of the sac, recurrence has taken place in but 1 instance. The method of injecting irritating substances into the sac is painful and uncertain. Extensive edema may occur. Suppuration of the sac, abscess of the testicle, and carbolic acid poisoning have been noted. In one case treated by carbolic acid injection testicular abscess, lymphangitis, and death occurred. The operation which has thus far given the best results is that of partial excision of the sac, but it takes time, is liable to be accompanied by troublesome bleeding, and there is always danger of a recurrence. Horwitz has performed the Doyen operation—eversion of the sac—8 times. He believes it to be the most satisfactory operation thus far brought forward, but he says it is still on trial. In large hydroceles with thickened sacs the operation would not be feasible and partial resection of the sac would have to be resorted to. In all cases operated upon by the Doyen method a painless enlargement of the testicle resulted; this was not attended with any fever and gradually subsided in 10 days.

The "New York Medical Journal," in an editorial, March 30, 1901, expresses the opinion that **varicocele** is more of a blemish than a serious

[1] Trans. of College of Phys. of Phila., Apr. 3, 1901.

departure from the normal. This is not the opinion of the laity and probably not the conviction of the younger members of the profession. According to the army ruling a candidate for enlistment should be rejected if he has a varicocele larger than the sound testicle; if, after his acceptance, he is found to have a varicocele as large or larger than the sound testicle, he is not to be discharged, but is to undergo an operation for its radical cure. "Except in case of a capital operation involving the risk of life, a soldier cannot refuse to submit to medical treatment or surgical operation without subjecting himself to trial by court-martial for wilfully avoiding treatment the purpose of which is to enable him to perform the duties for which he enlisted." (Circular No. 11, Adjutant-General's Office, Dec. 10, 1884.) According to Senn, in Circular No. 3, too many operations are performed for varicocele. He instructs his students that surgical intervention should be restricted to exceptional cases in which well-marked symptoms are present independently of the nervous phenomena induced by quack literature. Of 9815 recruits, 2078 were affected with varicocele. It was more frequent in the robust than in the frail; atrophy of the testicle was seldom noted. Only 3 or 4 complained of any uneasiness as the result of the varicosity. There are, however, undoubtedly cases which require operation; this may best be done by the high method—that of opening the inguinal canal for 1½ inches and ligating all but one of the dilated veins *en masse* at each end of the incision and excising the intervening portion. This operation is easy to perform, certain to cure, will not produce atrophy of the testicle, and it is done in a field which is readily sterilized.

Naruth [1] thinks that dilation of the inguinal canal is responsible to some extent for the development of **varicocele.** With this idea in view he attacks the dilated veins in the inguinal canal, which is afterward closed as one obliterates the canal in the Bassini operation for the radical cure of hernia. The wound is less likely to be infected than when a scrotal incision is made, the venous circulation is sure to be interrupted, the spermatic artery is in less danger of being included in the ligature, the inguinal canal is narrowed, and the testicle is raised.

J. R. Eastman [2] believes that the dangers of mechanical urethritis and cystitis are overestimated as the result of a **retention catheter,** and that after the catheter has been in contact with the mucous membrane for several days a distinct tolerance develops. A large catheter is rather to be chosen than a small one, as it completely fills the lumen of the urethra, so that irritation by its movements is reduced to a minimum and it probably more effectually relieves spasm of the neck of the bladder.

F. C. Valentine [3] says perfect **asepsis of the urethra** cannot be obtained by our present methods; antiseptics by mouth are limited in their action; washings with piston syringes, however large, fall short of their purpose; asepsis of instruments and hands does not suffice to pre-

[1] Wien. klin. Woch., Jan. 25, 1900. [2] Jour. Am. Med. Assoc., Apr. 13, 1901.
[3] Jour. Am. Med. Assoc., Jan. 12, 1901.

vent urethral fever; and that urethral fever does not occur when the instrumentation is preceded and followed by irrigations. The author several years ago devised an irrigator for office work. He now describes an autoirrigator for the use of gonorrheal patients who cannot visit the physician as often as is necessary, for the use of patients who are obliged to catheterize themselves, and for the surgeon to carry with him. Its essential features are a modified douche bag made in one piece, with a tube 4 feet long, terminating in a shield and nozle, the tip of which has a special finish which cannot injure the most sensitive meatus.

Frederic Griffith [1] suggests a **simple urethral irrigator** which consists of a glass tube to which is attached the rubber tubing of an ordinary fountain syringe. Half of an atomizer bulb is pushed over the glass tube and thus acts as a shield, the concave portion of the half-bulb being toward the meatus.

Morgan I. Finucane [2] describes the operation usually performed for **elephantiasis of the scrotum** in the Fiji Islands. Under chloroform anesthesia an Esmarch's tourniquet is wrapped twice around the base of the scrotum and the ends brought up and fastened around the waist. After passing a finger into the preputial opening and locating the glans penis, an incision is made along the dorsum of the penis, liberating the organ, which is now drawn forward and held out of the way by a sound in the urethra. A circular cut is carried from the external abdominal ring of one side around the middle of the testicles to the ring on the opposite side, and the tunica vaginalis and spermatic cord isolated. A large hydrocele is almost invariably found; after this has been tapped the thickened tunica vaginalis is trimmed off, leaving nothing but the cord and testicle on each side. Large skewers are passed through the perineal skin just below the tourniquet, to prevent its retraction, and the mass severed from the body. In large tumors from 20 to 30 vessels will be seen and will require ligation. The skewers and the band are removed and the general oozing of blood checked. A scrotum is fashioned from the skin of the perineum and inner sides of the thighs, and as much of the penis covered as possible. It is rare to find an adult in the province of Ra who has not elephantoid enlargement of some portion of his body. Involvement of the leg, arm, and breast is common among the Fiji women. Every child suffers from periodic attacks of "wagaga," which is a lymphangitis generally occurring in an extremity or in the testicle or spermatic cord. Abscesses frequently develop from these local inflammations of the lymphatic vessels. Quinin internally with local measures is the usual treatment.

A. C. Panton [3] reports a case of **perversion of the sexual instinct** in a man aged 68 years, who delighted in mutilating his scrotum with a pocket knife. At one time he divided the scrotum in half and sewed the wounds so that each testicle was contained in a separate investment of skin. Later he inserted a glass marble into the right scrotum. Finally, after inflicting a 2-inch wound in the left scrotum, the bleeding

[1] N. Y. Med. Jour., Dec. 29, 1900. [2] Lancet, Jan. 5, 1901.
[3] Med. Rec., Sept. 15, 1900.

became unmanageable and he was forced to apply tight bandages to the base of the scrotum, which caused a moist gangrene of the parts. He recovered after the removal of the testicle and scrotum on the left side.

Daniel Stroch [1] narrates the history of a patient who performed **self-castration** because of a belief that the testicles, which were the constant seat of pain, prevented his pleasing his employers. The entire scrotum was removed with the testicles. He was brought to the hospital suffering with acute anemia. One week later he had a nocturnal emission and small numbers of spermatozoa were found in the discharge.

Ramon Guiteras [2] divides **impotence** into three varieties—organic, psychic, and atonic. Atonic impotence is either adynamic or irritative. The first may follow disease or injury of the brain or spinal cord, debilitating maladies, and the use of certain drugs. The irritative form is said to be due to congestion or inflammation of the deep urethra or its appendages, which keeps the lumbar center in a state of excitement. In the majority of all cases of atonic impotence seminal vesiculitis is by far the most important and the most marked pathologic condition present. The vesicles are usually very tender; they may be dilated from pressure on or stenosis of the ducts; they may have a pasty feel; they may be thickened and irregular from inflammation; or they may be atrophied and impossible to outline, but still markedly sensitive. A cold sound will excite any posterior urethritis which may be present and aphrodisiacs will increase the irritability of the parts. Guiteras advises neutralizing the urine, administering a hot rectal injection of salt solution every night, and massaging the seminal vesicles every 5 days. The urethra should be irrigated after the massage when there is any inflammation of the posterior urethra associated with the condition. After inflammation has subsided stimulants and electricity may be employed. Seven cases are cited to illustrate the foregoing observations.

Emil Ries [3] states that the **male is the cause of sterility** in over 30 per cent. of all sterile matrimonies; that this sterility is due to impotentia cocundi or to impotentia generandi, and that impotentia generandi is either aspermia or azoospermia. He discusses the latter, saying that it is either due to lack of production of spermatozoa or to obstruction of the sperm-channels, which may be caused by extrinsic compression or intrinsic obliteration. It appears most likely that the theory of compression from without, though hoary with age, is untenable because anatomically unproved. The interruption of continuity of the epithelial channel of the vas deferens is a most potent and not infrequent factor, the mucosa being transformed into a mass of cicatricial tissue. Obliteration of the seminal vesicle in itself does not mean any direct obstruction to the flow of semen, but from the experiments of Rehfisch and others it is likely that it interferes seriously with the normal function. He doubts the findings of Fenger, who claims to have observed obliteration of the ejaculatory duct. These changes may be due to gonorrhea, syphilis, or tuberculosis. Referring to the testicle, there are two classes of

[1] Jour. Am. Med. Assoc., Jan. 26, 1901. [2] N. Y. Med. Jour., Aug. 11, 1900.
[3] Medicine, July, 1900.

aspermatogenesis—that with and that without associated changes in the connective tissue surrounding the seminiferous tubules. In the larger class, that with connective-tissue change, there is a zone of hyaline tissue around the tubules in place of the normal flat connective-tissue cells. This zone cuts off the nourishment of the epithelium and finally usurps the place of the entire seminiferous tubule. In the smaller class, that without connective tissue involvement, the process in the testicle is sporadic. The pathologic tubules present either a single layer of epithelium composed of spermatogonic and sustentacular cells, or if further advanced, the spermatogonia have entirely disappeared. These tubules present no trace of spermatozoa, spermatocysts, or spermatoblasts. The epithelium is frequently infiltrated with fat, as pointed out by Cordes. The cause of these conditions is not clear. In obliteration of the vas deferens **surgical interference** may be employed. Van Hook has successfully anastomosed the divided ends of the vas deferens in dogs, and it has been practised in the human being after unintentional division during hernia operations. If no dilation of the vas or epididymis indicative of obliteration is found, it would be correct to split the testicle, examine its surface, and investigate the juice squeezed from it. The uncertainty, which is the worst torture of these patients, can thereby be definitely settled.

Emil Ries [1] reported to the Chicago Medical Society, June 13, 1900, a case in which he **removed the right seminal vesicle, vas deferens and epididymis, and the tail of the left epididymis,** anastomosing the left vas deferens with the body of the epididymis by sutures going through the muscular coat. The patient, who was suffering from primary genital tuberculosis, recovered.

Dr. Heresco,[2] of Bucharest, read before the Thirteenth International Congress of Medicine a paper on the subject of the **remote effects of internal and external urethrotomy and of resection of the urethra.** The author lays the greatest stress upon the fact that internal urethrotomy must be followed by persistent and regular dilation, otherwise relapse will occur, although it may be postponed for a number of years. Resection of the urethra is only feasible in cases of traumatic stricture. When there are a number of perineal fistulas, external urethrotomy is to be preferred. Dilation should follow all of these operations upon the urethra. Albarran, in discussing the same subject, spoke of the use of electrolysis in the treatment of stricture, and said that he had found that slow electrolysis gave better results than the rapid method, but that the treatment had not been used for a sufficient length of time to give us an idea of its remote results. Internal urethrotomy could only be considered as the first step of dilation. Resection of the urethra in limited inflammatory strictures of the perineal portion of the urethra is productive of good results.

[1] Chicago Med. Recorder, July, 1900.

[2] Lancet, Aug. 11, 1900.

DISEASES OF THE BLADDER AND PROSTATE.

L. Bolton Bangs [1] presents a **contribution regarding the Bottini operation for the radical relief of prostatic obstruction** and relates his experience with this operation. It should always be regarded as a serious undertaking, and a most careful preparation of the patient should precede the operation. This method of treatment can best be carried out when the patient is under the influence of a general anesthetic. Frequent urination is a most constant postoperative symptom. Hematuria is present for 2 or 3 days, but then usually subsides. Particles of burned tissue will appear in the urine after the first week, and fever is more or less frequent. Epididymitis occurs occasionally. Bangs thinks the postoperative period is more nearly 3 than 2 weeks, and emphasizes the fact that the after-treatment is as important as the operation itself. The patient should not be allowed to pass from observation until the urine is clear and all symptoms of irritation have disappeared. It is also well to examine the bladder with a cystoscope before discharging the patient. Among the postoperative complications incontinence of urine must be mentioned. This condition was present in 2 out of Bangs's 36 cases. Sixty per cent. of his patients have discontinued the use of the catheter; 20% have an increased amount of spontaneous urination and are able to reduce the use of the catheter from one-half to only that which is required for occasional treatment; 20% received no benefit, or, if any, but very little. The largest percentage of cures was in those patients wholly dependent upon the catheter. The time for the reappearance of voluntary urination after operation varies. Sometimes it immediately follows operation; the longest period noted in Bangs's cases was 2 months. Willy Meyer, in discussing Bangs's paper, said that he had operated upon 39 cases and that gonorrhea was present in 75%. When local anesthesia is employed, he combines $\frac{2}{3}$ ounce of a 2% solution of cocain with 1 ounce of a 3% solution of eucain. When the kidneys are normal, general or spinal anesthesia has been employed. He has used the latter in 5 cases with satisfactory results. When the pain after operation is intense, Meyer introduces and retains in position a smooth Mercier catheter. In one patient this catheter was kept in position for 30 days. Prostatectomy commends itself more as a surgical procedure. Fuller said that he feared relapses after the Bottini operation from cicatricial contraction and preferred prostatectomy. The Bottini operation, he thought, did not give a proper rest to the bladder. Gouley thought that the treatment adopted should be made to suit the individual case, and that when this was done our results would be better. The Bottini operation, for instance, is contraindicated in cases in which the so-called third lobe projects for 2 or 3 centimeters into the bladder. He thought the dangers of prostatectomy had been exaggerated. Alexander expressed approval of Bangs's views regarding the Bottini operation.

Freyer [2] discusses **enlargement of the prostate** in two clinical

[1] Med. Rec., Mar. 9, 1901.

[2] Lancet, 12 and 19, 1901.

lectures. He thinks the term "senile" should not be applied to the enlargement of the prostate, since this condition is not dependent upon senility. About 33% of all men past 55 years present some enlargement of the prostate, but only about 5% suffer from symptoms. When the hypertrophy involves the whole gland and the enlargement is uniform, symptoms are not usually present. Enlargement of the middle lobe presents the most marked symptoms. Occasionally the enlarged gland presents the appearance of a fibromyoma. Usually, however, the hypertrophy involves the glandular tissue largely and the growth would seem to be an adenoma. The so-called prostatic tumors, which are localized hypertrophies, may occur anywhere in the gland, and as they grow project into the bladder, being attached only by small pedicles. The length and course of the urethra may be considerably changed according to the position of the hypertrophy. Changes in the bladder-wall take place, with frequently the formation of a prostatic pouch. Not infrequently infection from foul urine extends up the ureter to the kidney. Prolapse of the rectum and hemorrhoids are apt to result from constant straining in micturition. Freyer thinks that prostatic hypertrophy is analogous to fibroid disease of the uterus. He thinks the condition is due to a general arterial sclerosis. When the amount of residual urine is large, and can be determined by palpation and rectal examination, the whole amount should not be withdrawn from the bladder at the first examination. He urges a most thorough examination of the prostate by the finger introduced into the rectum, the patient occupying first a recumbent and then a knee-chest position. Examination with the sound and cystoscope will decide the degree of hypertrophy of the middle lobe. After such examinations the patient should always remain in bed for a day. **Treatment:** In certain selected cases some form of operative treatment may be recommended; in a few cases it is imperative, but in the majority of cases clean catheterization and a proper hygienic life is the best treatment. When the prostate is enlarged, but does not give rise to symptoms, no treatment is indicated. If symptoms of obstruction are present and the amount of residual urine is small, Freyer employs ergot and the weekly introduction of a bougie as far as the bladder. When the residual urine reaches 4 ounces, the catheter should be used once a day; 6 ounces, twice a day; 10 ounces, three or four times a day. When all voluntary power disappears, the catheter should be employed as often as the desire to urinate is markedly felt. It is a mistake to limit the patient to a certain hour for catheterization, since the catheter should be used before pain and marked discomfort are felt. The choice of the catheter will depend upon the form of obstruction. Usually a soft Coudé, No. 7 or 9, is most useful. Under no circumstances should the patient be allowed to use a metal catheter. The necessity for aseptic precautions in performing catheterization in these cases is most urgent. The hygiene of the patient should be most carefully looked after; also the diet, the clothing, the bowels, etc. Horseback and bicycle riding are to be condemned, as is also sexual excite-

ment. Under proper care many patients are able to perform their duties and enjoy life for 15 or 20 years after entering upon the habitual use of the catheter. In examining the cases in which the disease is far advanced and the urine turbid or fetid, the examination should only be made when the patient is in his own bed, and only a portion of the urine should be withdrawn at the first examination. It is a mistake to examine such a patient in one's office, since urethral fever is apt to follow. Cystitis in these cases is also a common complication. When it is present, Freyer has found large doses (25 grains) of boric acid to be better than small doses frequently repeated. When pus is present in the urine, daily irrigation should be employed. A solution of silver nitrate is recommended, beginning with a solution of 1 : 4000 and gradually increasing it to 1 : 750. When great pain and scalding are present at the neck of the bladder, a dram of 1 % to 3 % solution of silver nitrate thrown into the membranous urethra is of great advantage. Complete retention of urine should be relieved by the catheter, aspiration, or drainage, as soon as possible, else an atony of the bladder will result. A preprostatic pouch is frequently overlooked or mistaken for the bladder cavity itself. This cavity is a greatly dilated prostatic urethra together with a portion of bladder in front of the enlarged middle lobe. Freyer has several times removed stones from this position. Hemorrhage is liable to take place in advanced cases of prostatic hypertrophy, but is not serious unless due to a ruptured varicose vein in the gland. Rest in bed is the most important part of the treatment for hemorrhage. Frequent hemorrhage after exercise would suggest the presence of a stone. Orchitis, urethritis, and balanitis occur not infrequently as complications of a prostatic hypertrophy, the last two being frequent in patients suffering from diabetes. **Operative treatment:** Freyer describes the various operations for the removal of the enlarged portions of the prostate and recommends, in cases of enlargement of the middle lobe, the suprapubic operation of McGill. For enlargement of the lateral lobes an operation devised by himself is suggested, which consists of a preliminary incision through the urethra which is followed by Dittel's incision through the perineum. The wound in the urethra permits of the introduction of the finger into the bladder, a thorough examination of the gland, and its easy protrusion into the perineal incision. Another advantage offered is the means of thorough drainage after the operation. It also serves the important purpose of protecting the bladder from injury, as the finger can appreciate the approach of the cutting instrument. Freyer discusses carefully the question of castration, its very satisfactory results and its objectionable features. The greatest objection to the operation is its mortality in far advanced cases, and these are the only ones in which the operation is acceptable to the patient. Vasectomy does not present the objections that castration does, but the results from this operation have not been so satisfactory. These operations successfully prevent the distressing complications of orchitis and epididymitis which so frequently occur in prostatic patients. Vasectomy offers little prospect of relief in cases in

which the enlargement is of the hard fibroid variety. Vasectomy permits the expulsion of semen, but does not interfere with the sexual power. Drainage as a palliative measure should be obtained through the perineum when it is required temporarily, and when the patient is in a feeble condition. When permanent drainage is desired, the suprapubic route is the best.

Fuller [1] describes a new method of **exposing the seminal vesicles and prostate gland** for purposes of extirpation and drainage. The patient is placed upon the table with his face and abdomen down and his thighs flexed upon the abdomen astride the table. The portion of the table which supports the pelvis is then elevated as in the Trendelenburg position. The incisions are made on either side of the anus along the inner border of the tuber ischii, and are connected by a transverse cut across the perineum about ¾ inch anterior to the anus. The rectum is then carefully lifted up and separated from the urethra and bladder by careful dissection. The finger in the rectum enables the operator to avoid wounding this organ. Fuller has used this method on five occasions for operations of various kinds upon the seminal vesicles, and has found it most satisfactory. His article is illustrated by three cuts, which show the position of the patient on the table and the line of incision.

Alexander G. Miller,[2] in discussing **residual urine in cases of enlarged prostate,** urges that patients suffering from this condition should in the early stages practise making a second effort to empty the bladder after each act of micturition. This recommendation to his patients has proved of the utmost benefit, as often with the second effort the patient has been able to empty the bladder almost entirely. He thinks that this, if practised in the early stages of prostatic enlargement, may greatly postpone the day of catheterization.

Dr. F. Legeue [3] read a paper on the **remote effects of operative treatment of hypertrophy of the prostate** before the Thirteenth International Congress of Medicine. The author does not think the remote results of double castration are as satisfactory as the early observations would indicate. Great improvement, however, follows this operation, and it is far more satisfactory than vasectomy. Cystotomy relieves the symptoms, but leaves the patient with a urinary fistula. The author thinks the operations upon the gland itself are productive of the best results. Bottini's operation cannot be judged now as to its remote results. Partial prostatectomy is productive of excellent results in partial hypertrophy, but when the hypertrophy is uniform the advantage is very slight. The author thinks that total prostatectomy offers the best results of all methods of treatment and is the operation of election.

Nathan Jacobson,[4] in discussing the surgery of **malignant disease of the prostate gland,** reports a case of primary carcinoma complicated by stone in the bladder. The patient was a man aged 34 years. His attention was first called to his condition by observing a marked

[1] Jour. Am. Med. Assoc., May 4, 1901.
[2] Brit. Med. Jour., July 14, 1900.
[3] Lancet, Aug. 11, 1900.
[4] Ann. of Surg., Mar., 1901.

sediment in the urine. This was followed in a few months by an attack of dysuria and the passage of ½ ounce of fluid composed largely of blood. Constant frequent micturition developed, with repeated attacks of profuse hematuria. Exercise increased the amount of mucus and blood in the urine. One year after the onset of the symptoms micturition occurred every 2 hours during the day and every hour at night. Pain on pressure over the pubes was more marked on the right side than on the left. The catheter was employed night and morning, the residual urine amounting to 4 ounces. The voluntary micturition was accompanied by considerable straining, but very little pain attended or followed this act. The urine was alkaline in reaction, containing considerable albumin, numerous triple phosphates, pus-corpuscles, and red blood-cells. The patient had become very anemic as a result of the loss of blood. Examination with the sound demonstrated the presence of a calculus, and digital examination by the rectum revealed a large indurated and nodular prostate more marked on one side than on the other. The gland was immovable and the rectum seemed fixed to it. About 1 month after this examination a suprapubic cystotomy was done. Two stones, each about ¾ inch in diameter, were removed. Examination of the prostate revealed what appeared to be a malignant growth. The entire gland was shelled out, after stripping off a portion of its mucous membrane, with considerable difficulty. Hemorrhage was profuse, but was controlled after the removal of the gland by hot irrigation. Perineal section was then made and drainage established in this way as well as through the suprapubic wound. Both wounds closed very slowly, particularly the one above the pubes. About 2 months after the operation the patient was able to empty the bladder entirely, the residual urine amounting to only 1 dram. Considerable improvement followed the operation, but repeated attacks of hemorrhage from the bladder soon developed and the patient died about 6 months later as a result of hemorrhage. About a month before death ulceration into the rectum had taken place and some fecal leakage into the bladder occurred. The diagnosis of carcinoma was confirmed by microscopic examination. The author thinks that malignant disease of the prostate has often been mistaken for hypertrophy of the gland. Extension of malignant disease from the bladder to the prostate is rare, but from the rectum is not infrequent. Sperling found in 39 cases of primary carcinoma of the bladder that the disease had involved the prostate in only 2 instances. Sarcoma of the prostate is rarer than carcinoma. Sarcoma pursues a very rapid course of from 3 to 6 months' duration. In children sarcoma of the prostate attains an enormous size, in one instance having reached the level of the umbilicus. The tumor is usually of the round-cell variety. Occasionally fragments of the growth are discharged with the urine. Guyon described a form of diffuse prostatopelvic carcinoma which was soft to the touch, giving the sense of fluctuation in some instances and extending very rapidly. Metastases occur very frequently in prostatic carcinoma. Death from uremia is the usual termination, although

occasionally patients die from rectal obstruction. Not infrequently rectal obstruction is more marked than urinary. An important point in the diagnosis is the occurrence of pain not associated with either urination or defecation. The cystoscope, excepting when the bladder itself is involved, has been of little service. Jacobson calls attention to two interesting points in his case; first, the presence of calculus, and second, the fact that after a total prostatectomy the patient was able to retain and void his urine.

Orville Horwitz [1] reports 161 operations for the **relief of senile hypertrophy of the prostate gland.** The operations performed in these cases were vasectomy, bilateral castration, suprapubic cystotomy, suprapubic prostatectomy, suprapubic cystotomy combined with perineal section, perineal prostatectomy, and Bottini's operation. After a discussion of the indications for and results from these various operations, Horwitz reaches the following conclusions: "(1) Success following the Bottini operation depends on having perfect instruments, a good battery, the necessary skill, and the employment of a proper technic. (2) In suitable cases the Bottini is the safest and best radical operation thus far advised for the relief of prostatic hypertrophy. (3) It is often very efficacious in advanced cases of obstruction as a palliative measure, rendering catheterism easy and painless, relieving spasm, lessening the tendency to constipation, and improving the general health. (4) It is of especial service in the beginning of obstructive symptoms due to hypertrophy of the prostate gland, and may be regarded as a means of preventing catheter life. (5) It is indicated in all forms of hypertrophy except when there is a valvular formation, or when there is an enormous overgrowth of the three lobes associated with tumor formation, giving rise to a pouch, both above and below the prostate gland. (6) When the bladder is hopelessly damaged, together with a general atheromatous condition of the blood-vessels, associated with polyuria, results are negative. (7) Pyelitis is not a contraindication to a resort to the operation. (8) The character of the prostatic growth has no bearing on the results of the operation."

Reginald Harrison [2] reports a number of cases of **vasectomy** done for the relief of hypertrophy of the prostate. Patients suffering from prostatic hypertrophy may be divided into three classes according to the results obtained from vasectomy: (1) Those whom double vasectomy benefits permanently and fully; (2) those whom under certain restricted conditions it benefits; (3) those who derive no benefit from it. In the first class belong those cases in which the prostate is beginning to enlarge, in which the bladder as a container and expeller of urine has suffered no pathologic change, and in which the use of the catheter for residual urine has just been started. When the operation is performed upon these patients, all the objective and subjective symptoms subside, the gland shrinks a great deal, the cystitis, if present, is relieved, frequent micturition and dribbling cease, and catheter life is either ended or postponed for a long time. Such results may be classed as cures. The patients

[1] Phila. Med. Jour., June 8 and 22, 1901. [2] Lancet, July 14, 1900.

belonging to the second class, those who are benefited somewhat, have suffered from marked cystitis, vesical dilation and atony, catheter life, etc., for some time. These symptoms are all benefited by the operation, but the bladder as an expeller of urine always remains deficient, and catheter life must be kept up. If hemorrhage and spasm or tension after catheterism are present, they are also relieved by vasectomy. In the last category are those in whom the disease is so far advanced that the only benefit obtained is an improvement of the bladder as a container and a partial lessening of the danger of ascending infection. Harrison also claims that the operation may be used as a prophylactic against the recurrence of stone.

J. R. Hayden [1] writes upon **conservatism in the diagnosis and treatment of prostatic hypertrophy.** He calls attention to the tendency of many surgeons to subject all cases of prostatic hypertrophy to some form of operative treatment before palliative or local treatment has been employed. In an examination of reports made of cases in which the Bottini operation has been performed he observes that the majority of the patients have suffered more from a posterior urethritis or prostatitis than from the enlargement of the gland. In such patients equally good results would have been obtained had they been given rest and local treatment. Even when the operation is imperative, it is well that it should be preceded by this form of palliative treatment. Among the palliative measures recommended are boric acid and urotropin to keep the urine acid, the administration of alkalies when the urine is acid, rectal injections of salt solution, hot applications, and the proper use of the catheter. Prostatic massage, as a general rule, should not be used, but, if employed, long intervals should intervene between the sittings. Rest in the recumbent position is useful in certain selected cases. Hemorrhoids and stricture of the urethra, if present, should receive treatment before operation upon the hypertrophied gland is undertaken. After all possible benefit has been obtained from this treatment the advisability of operative interference can be considered. Of the operative measures employed for this condition, Hayden thinks that partial or complete prostatectomy should have first place. Prompt and unobstructed drainage produces the most marked benefit in these cases.

Ramon Guiteras [2] discusses the **nonoperative treatment of prostatic hypertrophy with special reference to catheter life,** and deals minutely with the methods of applying the various palliative measures.

Freudenberg[3] has collected the reports of **683 cases of hypertrophy of the prostate** in which the Bottini operation was performed. The mortality in these cases was about 5 %. In only 6 % was the result pronounced a failure. The number of cases reported as cures was large enough to show that in a great majority there was a marked improvement, if not a cure. In performing this operation Freudenberg suggests

[1] Med. Rec., Mar. 23, 1901. [2] N. Y. Med. Jour., Mar. 2, 1901.
[3] Arch. f. klin. Chir., Bd. LXI, S. 941.

the practical value of moderately distending the bladder with air before the cautery is used. The finger in the rectum should invariably guide the surgeon in performing the operation. Although Bottini himself has given up the practice of always leaving a catheter in the bladder, Freudenberg advises it in cases in which there is hemorrhage or foul urine, or in which it is necessary to pass the catheter at frequent intervals, or in which passage is accomplished with difficulty.

J. R. Eastman[1] describes a **thimble made for the purpose of massaging the seminal vesicles.** Frequently the finger of the operator is not sufficiently long to reach the seminal vesicles comfortably, and the device of Eastman, consisting of a nickel-plated brass thimble, which adds about 1¾ inches to the length of the forefinger, is said to overcome this difficulty.

Goldman,[2] in discussing the **treatment of hypertrophy of the prostate** before the Thirtieth Session of the German Surgical Society, referred to a case in which suprapubic puncture had been performed and a catheter allowed to remain in the wound for 8 days. After the operation the patient suffered no more from symptoms of hypertrophy. Two years later the patient's bladder was examined postmortem and was found fixed to the abdominal wall in such a way as to exert traction on the internal urinary meatus. Following the suggestion offered by the cure in this case, Goldman has experimented on the cadaver and has operated upon several patients, fixing the bladder to the abdominal wall. He recommends cystopexy in suitable cases of prostatic hypertrophy.

After considering the **evidences of prostatic atrophy after castration,** Keys[3] presents the following conclusions: "(1) Experiments, whether on man or on the lower animals, relating to the normal prostate do not of necessity apply to the enlarged prostate. (2) I know of no direct pathologic evidence that castration has ever caused atrophy of a hypertrophied prostate. (3) There is direct pathologic evidence that in a few cases castration has failed to cause atrophy of the hypertrophied prostate. (4) The majority of cases reported thus far have been labeled 'cured' or 'improved' so soon after operation that many of them are doubtless instances of local depletion. (5) Clinical evidence of this is afforded by relapses occurring months after the operation. (6) Of the permanent cures some may well be instances of permanent advantage derived from reduced congestion. (7) The clinical evidence as to the actual atrophy of the prostate after castration lacks, as yet, its scientific confirmation, and has failed thus far to prove its title to the surgeon's credence."

Clarke[4] discusses the operation of **prostatectomy** at some length and strongly advises the employment of the operation in two stages. The first consists in a suprapubic cystotomy which enables the surgeon to determine accurately the exact condition of the prostate. A few days later the patient will be found in a much improved condition and the

[1] N. Y. Med. Jour., Oct. 27, 1900.
[2] Phila. Med. Jour., May 4, 1901.
[3] Med. Rec., July 21, 1901.
[4] Brit. Med. Jour., Oct. 20, 1900.

gland can then be removed with a much better prospect of a return to health. Clarke gives a brief account of 7 cases in which this plan of treatment has been carried out with a good result in each case. He maintains that a drainage for a few days is of great advantage to the patient.

Reginald Harrison,[1] in considering the **probable mode of formation of urinary stone relative to its recurrence and prevention,** refers to 101 cases of **litholapaxy** in 23 of which there was a recurrence of stone to some extent. The mortality in these cases was 6%. Most of the patients who had recurrence suffered from enlargement of the prostate or had pouched bladders and were accustomed to the use of the catheter. These conditions Harrison thinks are frequently responsible for recurrences. Recurrence after thorough operation is extremely rare in persons who do not suffer from any disease of the prostate or bladder. The after-treatment of cases in which litholapaxy has been done is strongly emphasized. This after-care should be continued in every case after the patient passes from the hands of the operating surgeon into those of his regular medical attendant. So long as the urine remains abnormal or unexpectedly becomes so, as is shown by the appearance, smell, or microscopic examination, the bladder should be carefully attended to until the condition is relieved. This attention consists in irrigation of the bladder and should be repeated at regular intervals. Boric acid and potassium permanganate solutions give the best results. The catheter employed in these irrigations should be large, so that small particles of stone may pass. When the bladder is known to be sacculated, it is well to employ the evacuator occasionally. When the mucous membrane remains relaxed and spongy, as is indicated by an excess of mucus in the urine, a solution of nitrate of silver, 1 grain to 12 ounces, should be introduced into the bladder after irrigation. Harrison does not approve of the stronger solutions of nitrate of silver. Raney's theory of the formation of stone by molecular coalescence is dealt with at some length. Harrison doubts the efficacy of drugs and waters to dissolve stone, although the use of these may prevent the formation of a calculus or recurrence after removal. Hard waters are condemned because they produce an excessive amount of mucus in the urine. The most efficient drugs are turpentine, sandal, and copaiba. Boric acid is also highly recommended because of its mild antiseptic qualities. Urotropin possesses to a marked degree the valuable power of clearing the urine and keeping it so. The solution of nitrate of silver lessens the tendency to the formation of stone by preventing molecular coalescence.

The present status of **litholapaxy** is discussed editorially in the "Philadelphia Medical Journal," November 24, 1900, the writer expressing the opinion that the operation of litholapaxy is the ideal one for stone in the bladder, and supporting his opinion by quotations from many prominent authorities.

A case of **successful lithotrity** for the removal of a clinical

[1] Lancet, Feb. 9, 1901.

thermometer from the bladder was reported by John H. Morgan.[1] The patient was a woman 32 years of age.

Blumer [2] reports a case of **intraperitoneal rupture of the bladder** in which recovery followed operation performed 4 days after the injury. The patient fell and struck his abdomen after having drunk a considerable amount of liquor. Subsequently he was unable to pass urine, and during the following 3 days developed distention of the abdomen, hiccough, and other symptoms which gave him the appearance of being a very ill man. Introduction of the catheter resulted in the withdrawal of 196 ounces of bloody urine, after which the abdomen assumed nearly its normal size. When the abdomen was opened, the bladder was found to have a vertical tear in its posterior wall sufficiently large to admit two fingers. There was no evidence of peritonitis. The rent was closed, the bladder tested, and the abdominal cavity washed out and closed with drainage. Some little leakage from the bladder into the abdominal cavity followed the operation, but made its way out through the tube. The patient ultimately made a satisfactory recovery. The case is interesting because of the time which elapsed between the injury and the operation, the large amount of fluid in the abdominal cavity producing so little trouble, and because the patient was able to walk 2 miles 4 days after the injury.

Thompson [3] reports a case of **acute traumatic prostatitis** of external origin which involved the bladder and seminal vesicles.

Gunshot wounds of the bladder are extensively discussed by Carl H. Andersen.[4]

Murray [5] presented before the New York Surgical Society a patient 40 years of age whom he had treated for **tuberculous cystitis** with permanent suprapubic drainage. The patient had suffered for a long time and was in a very bad condition at the time of operation. Since the operation he has been quite comfortable with a hard rubber tube to which is attached a soft rubber catheter, which conducts the urine to a urinal fastened to the thigh. The patient's general health is excellent and he has gained 44 pounds since the operation 18 months ago. The case is not presented as one of cure, but it shows that the surgical treatment of tuberculosis of the bladder is sometimes indicated. Bangs said that his experience had led him to decide not to open a tuberculous bladder unless compelled to do so.

In speaking of the **value of continuous catheterization in some genitourinary affections,** Christian [6] lays stress upon the importance of not allowing the catheter to enter the bladder. The instrument should be slowly introduced and should be permanently retained at the point at which the first urine begins to flow. In this way the end of the instrument rests in the prostatic urethra.

In writing upon the **surgical treatment of exstrophy of the urinary bladder,** Prof. Berg, of Stockholm,[7] presents his experience

[1] Lancet, Aug. 11, 1900.
[2] Brit. Med. Jour., Dec. 22, 1900.
[3] N. Y. Med. Jour., July 7, 1900.
[4] Medicine, July, 1900.
[5] Ann. of Surg., Mar., 1901.
[6] Therap. Gaz., Feb. 15, 1901.
[7] Brit. Med. Jour., Oct. 20, 1900.

in the treatment of 18 cases of exstrophy and concludes as follows: "(1) There is as yet no method of treatment suitable for every case of exstrophy of the bladder. In selecting a method we must take into consideration the local changes as well as the patient's age, general state, and especially the functioning of the heart and the kidneys. In so doing I think we shall meet a certain number of cases in which all the circumstances are so extremely favorable for the less dangerous treatment—I mean the direct union—that no other method ought to be thought of, at least not until this has been tried in vain. (2) We are able in a number of cases to create such favorable circumstances—which could not be affected by means of orthopedic measures—by a synchondroseotomy after Trendelenburg or an osteotomy after Berg. The last-named operation may have the advantages of a quite reliable osseous healing and of a more easily corrected position of the two halves of the basin. It can even be performed on older patients. Trendelenburg puts as the highest age for the operation 8 years. I have successfully osteomized a patient of 15 years. With both these operations the direct danger of the treatment no doubt becomes greater, and thus we are left to make our choice between the autoplastic method and the transplantation of the ureters. (3) I suppose that many surgeons yet prefer the autoplastic method as probably less dangerous. Personally I prefer, for reasons before named, to recommend the above-described method with single skin flap, covered by Thiersch's plan on its deep surface. (4) Considering the improved technic and the diminished danger which the operation of John Simon in our time has achieved, especially through Prof. Magell in Vienna, it seems probable that this operation will be found to supersede other methods in a number of cases. For my own part, I should not hesitate to make use of it in old cases in which the bladder is deeply destroyed or the other methods have failed. Though I fully join in Prof. Bergmann's opinion expressed 2 years ago, that our present treatment of this deplorable deformity is far from ideal, I still believe that the work of the past century even in this field has given us sufficiently firm ground for further labor, and that it would be unwise to make any wide departures from that which has already been gained."

A. E. Halsted[1] discusses the **treatment of exstrophy of the bladder** and reports an interesting case of vesicosigmoidal anastomosis with the Frank coupler. The patient unfortunately succumbed to shock shortly after the operation.

Exstrophy of the bladder is considered most extensively in a paper by F. Gregory Connell,[2] which was awarded the Senn Medal at the meeting of the American Medical Association, June 6, 1900. Connell reports and tabulates 24 experiments performed upon animals and draws the following conclusions: "Twenty-four experiments were made; of these, 1 animal escaped, the result of which would in all probability have been a recovery, as it was a unilateral implantation, and the series shows that all unilaterals recovered. Of the remaining

[1] Medicine, Dec., 1900. [2] Jour. Am. Med. Assoc., Mar. 9, 1901.

23 experiments, 5 recoveries resulted, and in each instance with stenosis and hydronephrosis; this is practically a removal of one kidney. The result attained in the foregoing series of experiments was not altogether unexpected. The literature establishes beyond peradventure that ureterorectal implantation has been, and still is, a very unsatisfactory operation. Especially is this true in cases in which both ureters are transplanted at the same time. The results obtained in experimentation on the lower animals are most discouraging. Matas, in speaking of Maydl's operation on dogs, considers the operation to be much more simple in the human subject, and less likely to be followed by septic infection; contamination from the bladder or bowel can be much more effectually guarded against, especially if the sigmoid mesocolon is long enough to permit the bowel to be dragged out of the median incision. Chaput is quoted as saying: 'I believe that the difficulty in obtaining good results in these operations on dogs is due in part to the very small size of the ureter in the animal, and in part to the great rigidity of the intestinal walls, causing the suture to cut through the tissues and rendering union almost impossible. The experiments on dogs, therefore, are not to be relied upon to furnish material from which to draw valuable conclusions as to the advisability of similar operations on man.' In every instance in which both ureters were transplanted, death followed in from 2 to 6 days, being due to peritonitis, with or without leakage. In each instance in which a single ureter was implanted at a first operation, the animals recovered from the operation without any bad symptoms, and passed urine per anum, or through the artificial bladder in the case which recovered after the making of such a bladder. The animals in which the second ureter was implanted at a second operation died in a similar manner to those in which the bilateral implantation was done at one sitting. The cause of this peritonitis is difficult to arrive at. All ordinary precautions were taken against infecting the peritoneal cavity. The same steps were pursued in the preparatory technic, in the same room, and with the same instruments, which were found to be absolutely safe by the same operator in performing intestinal work. Again, the dogs in which one ureter was transplanted recovered without any signs of peritonitis, but when two ureters were made to communicate with the rectum by the same method and under exactly similar circumstances, the operation was followed by this inflammation of the peritoneum and death. On necropsy it was found that in all cases of unilateral implantation stricture and hydronephrosis resulted. The fluid in the sac was never purulent, but on making cultures of this fluid cocci were found, with a few colon bacilli. In the other cases, when the necropsy was performed within a reasonable time after death, cultures were made, and in each instance both bacilli and cocci were found to be present. The ureter was implanted into both the large and small bowel, with apparently no difference in result. Unfortunately, the animals did not survive the operation for a sufficient length of time to allow that conclusions of material value be arrived at. But from the above experiments there can at least be deduced the conclusion, as confirmatory of others,

that the bilateral axial implantation of the ureters into the rectum is at best a dangerous procedure. Further experiments with the implantation of the trigone will be carried on and reported in the future."

PLASTIC SURGERY, BURNS, ULCERS, AND GUNSHOT WOUNDS.

Surgeon-General Sternberg [1] in his annual report states that during 1898 and 1899 there were 586 killed and 4333 wounded by **gunshot**—1 man killed for every 7.4 wounded. The proportion of killed to wounded during the Civil War was 1 to 4.56. Six per cent. of the wounded died; the corresponding percentage during the Civil War was 14.3. Of the 82 cases of gunshot fracture, 7.3% were subjected to amputation, a marked contrast to the 44.4% of those occurring during the Civil War. In penetrating wounds of the thorax the rate of mortality fell from 62.6% during the Civil War to 27.8% during 1898 and 1899. A mortality of 87.2% accompanied penetrating wounds of the abdomen during the Civil War; this fell to 70% during the last war. Of the 10 cases operated upon, 9 were fatal. The mortality for gunshot fractures of the cranium was 59.2% during the Civil War and 54.4% during the years 1898 and 1899.

Louis A. La Garde [2] publishes a study of **gunshot injuries by the rifles of reduced caliber** based on the 1400 wounded during the Santiago campaign. The men hit usually fell at once. Explosive effects were not noticed, the velocity being reduced by the long range and by ricochet. The balls lodged in 10% of the wounded. There were no deaths from hemorrhage. Gangrene resulted in 5 cases from injury to the vessels, and traumatic aneurysm was noted in 7 instances. Fractures of the diaphyses were rarely comminuted, and it was seldom necessary to remove loose fragments. Of 17 patients receiving wounds of joints, 14 were restored to duty and 3 were invalided. Of 31 cases of gunshot injury of the head, 58.1% ended fatally. Some were marked by extensive fracture and laceration of brain substance, doubtless from shots at close range; others by clean-cut perforation at point of entrance and exit, with few brain symptoms. These were from shots in the mid and remote ranges. Guttered fractures were apt to show extensive comminution of the inner table. Fifty-three penetrating wounds of the thorax were observed, with a mortality of 24.5%. This mortality is less than half that observed in the Civil War. Although more than half the cases of penetrating chest wounds were restored to duty, 37% suffered from complications. Of 41 penetrating wounds of the abdomen, 29 proved fatal. Three were operated upon with fatal results; all, however, were hopeless from the beginning. Of the 12 wounds resulting in recovery, all probably resulted from long range shots and recipients had been on scant ration for 3 days. No attempt was made to locate projectiles except with the x-ray. The Santiago campaign, as far as it goes, shows that wounds of the lower extremities are not nearly so frequent

[1] Phila. Med. Jour., Nov. 17, 1900. [2] Boston M. and S. Jour., Nov. 1, 1900.

as in former times. The battle tactics which cause a man to lie down to fire and to advance by rushes have doubtless added much to these results. The regional distribution of the wounds among those killed in action was reported in 64 instances as follows: head, 26; penetrating wounds of abdomen, 19; penetrating wounds of chest, 17; thigh, 1; leg, 1.

Henry G. Beyer[1] directs attention to the large number of **rifle wounds** in comparison to shell wounds which are received in battle. At the battle of Colenso 97.5% of all the wounds were due to rifle fire. The proportion of killed to wounded—1 to 4—remains the same as in former wars, although the percentage of recoveries among those hit is vastly increased; this is due as much to modern surgical methods as it is to the character of the bullets used. The author's experiments confirm Kocher's explanation of the explosive action of missiles; *i. e.*, that the energy of the bullet is transmitted from the parts first struck, primarily in the direction of the fire; next with increasing velocity in a funnel-shaped direction toward the exit, and lastly with the greatest velocities in all directions. The loss in the velocity of a bullet in passing through a substance is inversely proportionate to the hardness of the projectile and directly proportionate to its caliber. The more brittle tissue a part contains, the greater will be the lateral action of the missile. The larger the amount of fluid in an organ, the greater the explosive effect. The elastic tissues, as blood-vessels, etc., often are pushed aside by a slowly moving bullet, but are perforated by a high-velocity projectile. In the absence of more accurate information the surgeon may be trusted to read the range from which a bullet was fired by the character of the wound before him.

L. V. Cargill[2] narrates a case of **abscess of the brain** following a Mauser bullet wound. The missile entered 1 inch above the inner end of the eyebrow and emerged 2 inches above and to the right of the inion. The left arm and leg were paralyzed. Three months later the patient presented the classical signs of abscess of the brain. He was trephined over the motor area, but no abscess was found. By exploring further backward from 4 to 6 drams of thick, inodorous pus was evacuated from the occipital lobe. Death occurred the next day. At the autopsy two smaller abscesses were found in the parietal lobe and the paralysis was seen to be due to a destruction of the fibers of the internal capsule and not to the abscess.

J. Lynn Thomas,[3] in writing of his experiences in the South African war, mentions the phenomenal success following the expectant treatment of **gunshot wounds** of the abdomen. Concerning lodged bullets, he says they should be left alone for 1 or 2 weeks until the wound is firmly healed and the extravasated blood is absorbed, because of the diminished danger of infection. Operations for hemothorax are rarely required even when the heart is displaced. He has found the telephonic probe of great value during operations for the removal of

[1] Boston M. and S. Jour., Jan. 3, 1901. [2] Brit. Med. Jour., Oct. 6, 1900.
[3] Lancet, Nov. 3, 1900.

bullets; even after a foreign body has been located with the x-ray it is often most difficult to find. He employs the forceps tourniquet instead of a rubber band, as it is easily sterilized and does not deteriorate like rubber. Long operations are frequently done without antiseptic solutions and with only one sponge. One of the peculiar results of modern bullet injuries is the small entrance wound and the formation of a large subcutaneous scar due to the devitalization of the fluid-containing tissues for some distance around the bullet tract. In the treatment of traumatic aneurysms the author favors turning out the clots and ligating the ends of the vessels. He reports 2 cases; in one an aneurysmal dilation of the femoral developed on each side of the adductor opening, and the second involved the popliteal artery. In both cases the vein communicated with the false sac. He reports a third case in which the projectile passed through the thigh between the femoral artery and vein severing the internal saphenous nerve and injuring the sciatic nerve. About 2 weeks later an aneurysmal varix formed in Hunter's canal. Recovery followed ligation of the femoral artery above the original injury.

H. T. Cox [1] reports **2 cases of bullet wounds.** In Case 1 the humerus was fractured and the musculospiral nerve divided by a ricochet Mauser bullet. About 4 months later an attempt was made to bring the ends of the severed nerve together. After isolating the ends and tightening the sutures, about ¼ inch interval remained. Sensation and considerable power in the extensors of the thumb returned, but the wrist-drop persisted. In Case 2 an aneurysmal varix of the femoral vessels followed a wound from a Mauser, the bullet passing between the artery and vein. There was no expansile tumor, but a thrill could be felt and heard over the scar, which was 4 inches below Poupart's ligament. The artery was ligated above and below its communication with the vein. Complete recovery ensued.

W. E. Schroeder [2] writes on the value of **pediculated flaps in injuries of the hand.** Elasticity and resistance, which are desirable in the palm, are not obtained by either the Thiersch or free-flap method. A case is reported in which the hand was contracted into a fist subsequent to a burn of the palm. The contracted tissue was removed, the fingers straightened, and the hand placed beneath a flap of skin on the hip, the palm being turned out toward the under surface of the flap. Pockets were then made in the subcutaneous structures below this flap and the fingers slipped into them, the ends protruding through incisions in the skin. Sutures united these flaps to the skin of the fingers and of the wrist and to each other. A plaster cast held the hand in place. The pedicles were severed after the flaps had grown to the hand, and the wound on the thigh was closed by skin grafts. Three months after the operation the usefulness of the hand had increased considerably and the patient was able to flex and extend his fingers partially. Five other cases are mentioned, 2 of which were operated upon by Fenger, to whom is due the credit for originating the procedure.

[1] Lancet, Oct. 13, 1900. [2] Am. Jour. Med. Sci., Oct., 1900.

Mr. Moore [1] reports the case of a boy who sustained a severe **gunshot wound of the right forearm.** The skin on the flexor side of the forearm from the elbow to the wrist had been blown away and later 4 inches of the median nerve sloughed out. About 1 month after the accident the upper end of the median nerve was sutured to the ulnar nerve in the forearm near the elbow ; the distal segment of the median was attached to the ulnar lower down in its course. The skin defect was closed by a pediculated flap from the abdomen. Two months after the operation sensation in the portion of the hand supplied by the median nerve was good, but there was little power in the fingers and wrist.

Bianchi and Fiorani [2] give the history of a patient whose foot was the seat of a large granulating surface following an erysipelatous gangrene and which was **grafted with chicken skin.** The body of a live

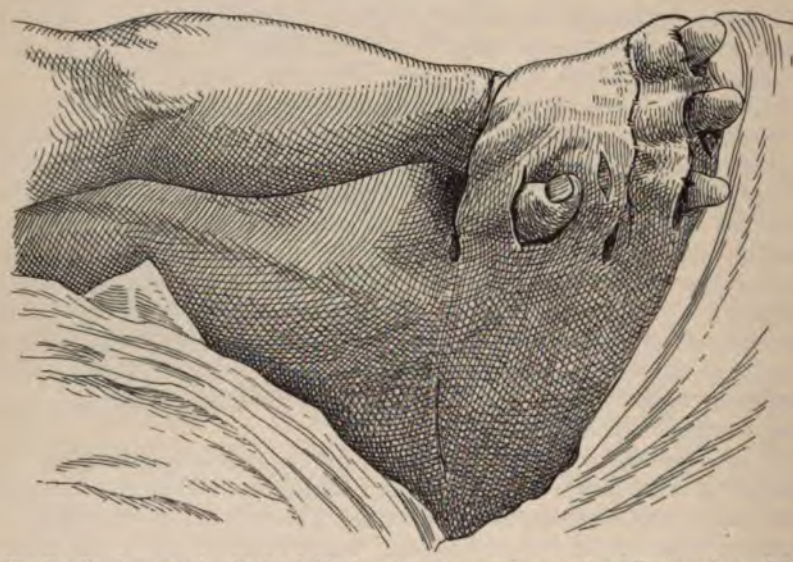


Fig. 59.—Employment of pediculated skin-flaps in treatment of contraction following a burn of the palm (Schroeder, in Am. Jour. Med. Sci., Oct., 1900).

chicken was scrubbed with soap and water, then with a 1% solution carbolic acid, and finally thoroughly rinsed with sterile water. Of the 14 grafts, each about $\frac{1}{3}$ inch square, only 3 failed to take.

K. G. Lennander [3] describes an **operation for incontinentia ani,** the steps of which are as follows: "(1) An incision over the lower part of the sacrum and coccyx is continued from the lowest point of the coccyx in horseshoe shape around the ischiorectal fossa. (2) The posterior part of the levatores ani and the anterior part of the coccygeus are opened up. (3) The levatores ani are completely separated from the coccyx and coccygeus, but care must be exercised in not too closely approaching the pelvic walls, so as to avoid the nerves of the levator

[1] Intercolonial Med. Jour. of Australasia, Dec. 20, 1900.
[2] Gaz. degli Osped., Dec. 2, 1900. [3] Brit. Med. Jour., Oct. 20, 1900.

ani, which, emerging from the sacral plexus, course along the side of the pelvis, over the upper surface of the muscle, just median to its origin from the arcus tendineus. (4) This opening in the pelvic diaphragm should be filled up by the median part of the glutei maximi. These fibers are next made loose from the sciatic ligament, the sacrum, and coccyx. (5) The portions of the levator ani springing from the coccyx and coccygeus muscle are brought forward and affixed to the rectum in such a way that they will compress the rectum on either side. (6) The parts of the glutei previously removed from their origin are now stitched together in the middle line, anteriorly to the levator ani and skin of the anus, and posteriorly to the periosteum upon the sides of the coccyx. These united muscles sink deeply between the point of the coccyx and the anus, and form a horizontal foundation for the pelvis, at the same time embracing the anal portion of the rectum posteriorly and laterally." Three cases were operated upon. In one the sphincter ani and part of the rectum had been destroyed by a phlegmonous inflammation; in the second incontinence had followed extirpation of a tuberculous prostate and urethra; the third case followed excision of the rectum for carcinoma. The first 2 cases were practically relieved of their incontinence and the third much improved.

W. R. Townsend [1] exhibited to the New York Neurological Society, February 5, 1901, a patient, aged 15 years, on whom he had operated for **claw hand** which had existed from birth. The extensor communis digitorum was passed through the interosseous space and attached to the severed tendons of the flexor carpi radialis, flexor carpi ulnaris, and palmaris longus. The boy is now able to write, whereas formerly he could not grasp a pen.

Lange [2] reports 2 cases of **periosteal tendon grafting** for deformity following poliomyelitis. A case of varus was treated by attaching the external half of the tendon of the tibialis anticus to the periosteum of the cuboid bone, with a satisfactory result. In a case in which the gastrocnemius was paralyzed the tendon of the peroneus longus was fastened to the periosteum of the os calcis. The patient is able to flex and extend his foot without any difficulty.

H. Littlewood, in a letter to the "Lancet," January 5, 1901, expresses his opinion that the term "**ischemic paralysis**" is a misnomer, the contraction occurring after elbow injuries in children, being really due to the contraction of cicatricial tissue the result of laceration of the flexor muscles. A swelling in the upper portion of the flexor muscles of the forearm has been present in all the cases which have come under his notice. Splint pressure and splint sores are in no way related to the production of the deformity.

R. A. Hibbs [3] describes a **new method for lengthening the tendo-Achillis** for equinus. The tendo-Achillis having been exposed by an incision, it is cut through two-thirds of its thickness near its insertion into the os calcis; the knife is then turned upward and the tendon split for the

[1] N. Y. Med. Jour., Mar. 16, 1901. [2] Zeit. f. orthop. Chir., Bd. VIII, S. 30.
[3] Lancet, Nov. 3, 1900.

required length. A quarter of an inch above the end of the longitudinal cut another transverse incision is made from the opposite side of the tendon through two-thirds of its caliber, and it is again split to within $\frac{1}{4}$ inch of the first transverse cut. The tendon is thus severed so as to secure its lengthening and at the same time preserve its continuity, as shown in the accompanying diagrams. In diagram 1, if *c d* is $\frac{1}{2}$ inch,

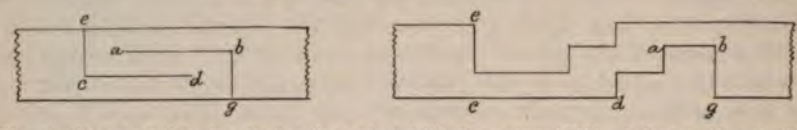


Fig. 60.—New method for lengthening the tendo-Achillis for equinus (Hibbs, in Lancet, Nov. 3, 1900).

b a $\frac{1}{2}$ inch, *a* to *e c* $\frac{1}{4}$ inch, and *d* to *g b* $\frac{1}{4}$ inch, then the lengthening would be $\frac{1}{2}$ inch + $\frac{1}{2}$ inch — $\frac{1}{4}$ inch — $\frac{1}{4}$ inch, or 1 inch — $\frac{1}{2}$ inch, or $\frac{1}{2}$ inch. [This method of tendon lengthening, according to Tillmanns, was devised by H. Sporon.]

Howard Lilienthal [1] recommends the use of **adhesive plaster for the closure of cutaneous wounds.** Zinc-rubber plaster sterilized by formalin vapor and sold under the name of Sterilized Z. O. strips is the material he uses. This method, the inventor maintains, saves time, does away with necrosis of the tissues from constricting sutures, and precludes stitch abscesses.

McKernon [2] believes that tracheotomy should always precede the operation of **uranoplasty.** The pharynx is packed with gauze and the anesthetic administered through the tube in the trachea. When the operation has been completed, a fresh gauze pad is placed in the pharynx and the mouth filled with gauze, the patient breathing through the tracheotomy tube.

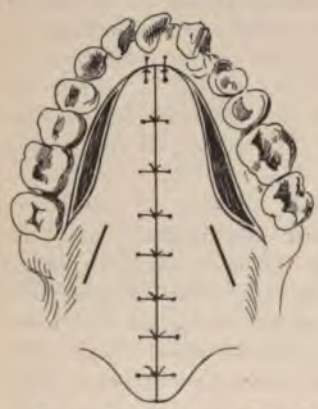


Fig. 61.—Taylor's operation for cleft palate (Dublin Jour. Med. Sci., Dec., 1900).

Edward H. Taylor [3] describes his operation for **cleft palate.** The patient is placed in the Rose position, a Smith gag is introduced into the mouth, and the blood and saliva removed by a suction apparatus. An incision is carried from just inside the last molar tooth along the alveolar margin forward, to terminate in the cleft. This flap, which contains the posterior palatine artery, is raised with a rougine. The flaps are attached to the gums in front and to each other by silkworm-gut sutures on a small curved needle. The operation is easily and rapidly performed, hemorrhage is not troublesome, the nutrition of the mucoperiosteal flaps is assured, and the mobility of the flaps facilitates the introduction of the sutures and precludes tension.

[1] N. Y. Med. Jour., Feb. 9, 1901. [2] N. Y. Med. Jour., June 16, 1900.
[3] Dublin Jour. Med. Sci., Dec., 1900.

Bukovsky [1] has treated 100 cases of **leg ulcer** with the toxin of Bacillus pyocyaneus. It seemed to clean the ulcers and cause more rapid healing than any other application.

X-RAYS.

Stembo [2] conducted a series of experiments to determine the **analgesic effect of x-rays.** The treatments were on alternate days, lasted from 3 to 10 minutes, and the interruptions were approximately 1500 to the minute. Twenty-eight cases of various painful affections are reported, in 75% of which pain was mitigated. Three treatments are commonly effective; if no relief follows ten applications, the treatment should be suspended. As the cathodal rays only are effective, the results cannot be due to suggestion alone. The surrounding healthy tissue should be covered with tinfoil.

R. Bowman [3] reports a case of **lupus vulgaris treated by x-rays and tuberculin.** The patient, a man aged 62, had a large ulcer involving the upper lip and three-quarters of the lower lip. Nodules could be palpated far out in the left cheek. Thirty-six injections of tuberculin were administered from March to June, 1900, causing a disappearance of pain and some healing. The rays were applied June 19, a lead mask covering the entire face except the ulcerating area. Thirty-five treatments were administered, resulting in a healing of the ulcer and of all the nodules save one. Previously various local remedies, including cureting, had failed to benefit the patient. The x-ray sittings, varying from 5 to 25 minutes, were always followed by swelling and the formation of crusts, but in no instance was new epithelium injured.

Carl Beck [4] presented to the Section on Surgery and Anatomy, at the Fifty-first Annual Meeting of the American Medical Association, a paper on **surgical errors in skiagraphy.** We should never forget that an x-ray picture is not an ordinary photograph, but a silhouette only, the interpretation of which requires a thorough knowledge of normal anatomic relations; and for this purpose it is necessary to have pictures of the shadows of the normal structures of the body always at hand for comparison. Slight irregularities of normal bone may at first sight appear to represent pathologic processes, but prove to be normal by thorough comparison with the normal skeleton. Muscles and tendons cause obscure shadows. The carpus is especially likely to produce errors; the tuberosities of the trapezium, the scaphoid, the hamulus ossis hamati, the os pisiforme, and the eminetia carpi volaris radialis and ulnaris double up the thickness of the carpus, thereby causing dark shadows which might be mistaken for foreign bodies. The foot presents an obstacle in the first and third cuneiform bones and the scaphoid, so that it is necessary to skiagraph these portions transversely. Normal

[1] Ann. de Dermatologie et de Syphiligraphie, 1899, No. 12.
[2] Therap. der Gegenwart, June, 1900. [3] Australasian Med. Gaz., Jan. 25, 1901.
[4] Jour. Am. Med. Assoc., Jan. 5, 1901.

sesamoids have been incorrectly interpreted and the os trigonum tarsi has been mistaken for a fragment severed from the astragalus. This bone is a typical part of the tarsus of all mammalia, and is estimated at from 7 % to 8 %. The significance of a skiagram for estimating the degree of functional disability is not always conclusive. Considerable bony deformity may be demonstrated and still the function may be scarcely disturbed. On the other hand, there may be but little evidence of bone injury, and yet severe impairment of function on account of the injured soft tissues. The greatest diagnostic difficulties are offered by the joints, especially the hip and elbow. Unless deformity or callus be present old fractures may escape detection. Callus often obscures the fracture-line in intraarticular fractures; rachitis sometimes misleads; and it is only after a comparison with the normal side and with a normal skeleton that the problem is solved. It is important to know the age at which epiphyodiaphyseal union takes place and to know what bones are ossified at birth. In all cases of suspected fracture and of suspected foreign bodies, at least two skiagrams in two different positions should be taken. Misinterpretations have also arisen from unavoidable mechanical and chemic effects, causing markings in the photographic plate. Blemishes may also be produced by pus from wounds or by perspiration.

Stenbeck [1] reports a **rodent ulcer of the nose treated by x-rays.** The tube was placed at a distance of 4 inches and each treatment lasted 10 minutes. On the fourth day reaction appeared and on the tenth day pus developed. The length of the treatment was soon increased to 15 minutes. After the ulcer had healed a smooth cicatrix surrounded by a slightly raised edge remained. [In the cases we have seen the ulcer has quickly returned after the cessation of treatment.]

The "Lancet," December 8, 1900, reports a **death associated with the use of the x-rays.** A woman, aged 68, fractured the left hip. Two skiagrams were taken, one after an exposure of 35 minutes and one after 45 minutes' exposure. These being unsatisfactory, a third exposure of 45 minutes was made. Several days later a dermatitis appeared, which developed into a sloughing ulcer. The patient died several months later. At autopsy the heart and vessels were degenerated; the wound showed little evidence of repair.

G. P. Newbolt and C. T. Holland [2] report **2 cases illustrating the use of the x-ray in surgery.** The first case was a boy aged 18 years, who was shot in the face while lying down. It was necessary to remove the left eye, but no bullet being found at the operation, an x-ray plate was taken. The bullet had passed through the left eye, entering at the left side of the bridge of the nose, just internal to the internal canthus, and lodged beneath the masseter muscle, from which place it was removed through a small incision. The second case was a boy aged 16 years, who had fallen and driven a false tooth attached to a vulcanite plate into the esophagus, from which it was extracted by strong forceps.

[1] Hygeia, Stockholm, 1900, p. 18.

[2] Lancet, Mar. 9, 1901.

Fig. 62.—Reproduction of skiagram by Mr. C. Thurstan Holland, showing bullet and scattered fragments in the face for 2 days (Newbolt and Holland, in Lancet, Mar. 9, 1901).

Fig. 63.—Reproduction of skiagram by Mr. C. Thurstan Holland, showing vulcanite plate, with one tooth and hooks, in the œsophagus for 6 hours (Newbolt and Holland, in Lancet, Mar. 9, 1901).

In a paper on **radioscopy of the mediastinum,** read at the International Congress of Electrology and Radiology, Paris, 1900, Mignon,[1] after pointing out the difficulty of examining clinically the mediastinum, divides his subject into three parts—the anterior, the lateral, and the lateral oblique methods of examination. Under the first division he calls attention to the shadow cast by the thymus gland in children up to the third year. He then describes a shadow occasionally seen situated on each side of the manubrium sterni, extending obliquely toward the axillas, and says this shadow corresponds to the large vascular trunks. Under the second part he maintains that the rays are the only means of diagnosing accurately an aneurysm of this part of the aorta. For the diagnosis of abnormalities and diseases of the esophagus he recommends the swallowing of metallic balls attached to strings as preferable to the metallic sound in cases in which hemorrhage or perforation of the esophagus is feared. By the lateral oblique method a clear zone is seen bounded as follows: below by the convex shadow of the diaphragm, in front by the shadow of the heart, behind by the shadow of the vertebral column, which includes those of the aorta, vena cava, and esophagus. If the aorta be the seat of an aneurysm the anterior border of this shadow is not vertical. This clear zone, somewhat triangular in shape, Mignon proposes to call the retrocardiac triangle. By the lateral oblique method we see that the heart is not actually in contact with the anterior thoracic wall.

J. F. Baldwin [2] reports a case upon which he **operated under the x-rays.** A boy 9 years old was shot in the right knee-joint. Three weeks later, the knee giving some trouble, a physician cut down upon what he supposed was the bullet presenting at one side of the patella, but found nothing. By means of a skiagram the bullet was located on a line with the upper border of the patella and resting on the internal femoral condyle. An incision was made, but notwithstanding a most thorough search, no bullet was found. The fluoroscope now showed the missile at the back of the knee-joint, it being loose and its position varying with that of the patient. The next day, in the dark-room, the bullet was located at the bottom of the joint. A pair of delicate forceps were introduced through a small lateral incision and an attempt made to seize the bullet, the operation consisting of repeated efforts to catch a shadow with a shadow. With great difficulty the bullet was finally grasped, but owing to the approximation of the articular surfaces it was found impossible to withdraw it. It was therefore pushed up to the opposite side of the joint and extracted through a minute counter-opening. [In a case in the Jefferson Hospital, in which a bullet was shown by a skiagraph, it could not be found at operation. The patient, while under ether, was taken to the x-ray room; the surgeon looked through the fluoroscope while operating. It was seen that the bullet had been retracted when the wound-edges were separated, and hence had been missed. It was readily seized and extracted from the supinator longus muscle.]

[1] Lancet, Jan. 12, 1901. [2] Jour. Am. Med. Assoc., May 11, 1901.

C. L. Leonard [1] writes on the value and accuracy of the **Röntgen method of diagnosis in cases of fracture,** saying the errors which have been attributed to this method are in reality due to its inaccurate employment and the misinterpretation of the results obtained. It can be definitely stated that fractures in the limbs can be detected. Fractures of bones in the body may be detected in favorable cases. When a negative is secured in which the cancellated structure of the bones can be distinctly seen, the presence or absence of all fractures can be determined beyond a doubt. One of the great advantages of this method is the possibility of establishing an absolutely negative diagnosis. The rays have shown that many fractures that were considered rare exist in a much greater proportion than was suspected, and that the functional loss which was supposed to result from a traumatism or sprain, and was termed traumatic arthritis or a "bad sprain," is often the result of an undetected fracture. Multiple fractures have also been shown where only one was suspected. The exact line of fracture is determined, enabling the surgeon to set the bone with greater facility and guard against the production of deformity, which the shape of the fragments shows is a mechanical possibility. Unnecessary pain and traumatism are avoided, and the accuracy of the fixation apparatus can readily be determined. Von Bergmann said at the International Medical Congress that the treatment of fractures had made two very important progressive steps in the past 10 years: One is the operative treatment of certain simple fractures, and the other in the field of diagnosis, through the study of their pathologic anatomy and the Röntgen method of diagnosis.

C. L. Leonard [2] writes on the **x-ray diagnosis of renal and ureteral calculi,** maintaining that the function of a kidney is frequently destroyed because of an unrecognized impacted stone, and that impacted ureteral calculi are more common than is generally supposed. The symptoms of kidney stones are very varied, often leading one to a diagnosis of floating kidney, dyspepsia, etc., when the Röntgen ray definitely demonstrates the real condition to be that of calculus. Of 5 cases positively diagnosticated as renal calculus, the author was unable to confirm the opinion by skiagrams and operation failed to reveal any stone. He refers to cases showing the presence of an unsuspected calculus after one stone had already been removed by operation, and mentions 4 cases in which calculi were present in both kidneys or ureters. It is impossible to exclude calculi from an apparently healthy kidney by any other method than the x-ray or a double exploratory nephrotomy. Further, by means of a skiagram a calculus may be diagnosticated before it has attained sufficient size to produce much change in the kidney parenchyma. A stone producing complete obstruction is really the most dangerous, as it produces so few symptoms. In skilled and experienced hands the negative x-ray diagnosis is infallible; of 136 cases of suspected stone, he made a negative diagnosis in 100, and in but 1 of these has the diagnosis been

[1] Med. News, Feb. 23, 1901.
[2] Ann. of Surg., Apr., 1901.

disproved by operation, the plate in this case being displaced and the reading of the negative defective. If the rays "will differentiate between the shadows of tissues less dense than the least dense calculus, all calculi will be detected." The negative diagnosis depends on the differentiation of the pelvic and lumbar tissues. Before operating for small ureteral stones it is advisable to employ a Bigelow evacuator, as the smallest ureteral calculi readily slip down into the bladder.

A. D. Bevan,[1] in an article on the **diagnosis of stone in the kidney by the x-ray,** says the whole subject of diagnosis of renal stones has been revolutionized in the last 2 years by the x-ray. Our clinical pictures are not always typical, and many other conditions produce a symptom-complex simulating or suggesting stone. Every operator of much experience has found that quite a large percentage of his supposed cases of nephrolithiasis were errors of diagnosis. Morris found no stone or other lesions to account for symptoms in one-third of his cases operated upon. The separate examinations of the right and left urine by the ureteral catheter and the Harris segregator are of but very limited use. The ureteral sound and waxed ureteral bougie are mentioned, not as practical aids to a diagnosis, but as interesting and unique surgical experiences. He unhesitatingly asserts that a perfect skiagram with the proper amount of detail and differentiation is of greater value as a means of diagnosis than an exploratory operation. This suitable penetration and differentiation is obtained by using a large volume of Röntgen discharge from a low-vacuum tube; exposure 5 to 10 minutes, depending on the thickness of the individual. He shows a skiagram depicting a single stone in the kidney, taken after an exploratory operation had failed to find any stone. In another case the rays showed three stones; two of these were found in the pelvis, and the third, which would have been overlooked but for the picture, was found in the kidney substance at a point shown by the skiagram. In a third case a large and three small stones were pictured. The large stone was easily found, the small stones only after a very patient search, which would not have been continued had not the skiagram shown the existence of others besides the large stone. He believes the mortality from nephrolithotomy is not so great as we have been led to think from a study of statistics, and that the prognosis as to permanent cure is not so good as after operation for bladder-stones or gall-stones, in some cases the stone recurring, in others the pyelitis persisting. M. L. Harris, in discussing the above paper, said it was quite probable that all kidney stones were of bacterial origin, and that a kidney which gave enough trouble to warrant an operation should be thoroughly explored if external palpation discovered nothing; it should be opened freely, and the interior carefully examined with the eye as well as with the finger. As both kidneys were affected in about 1 case in 6, it is of great importance to examine each kidney separately in all cases. He also emphasized the necessity of investigating the ureter, as much of the success of kidney operations depends on a patent ureter.

[1] Ann. of Surg., Mar., 1901.

C. L. Leonard[1] details **recent progress in Röntgen-ray diagnosis.** The recognition of the varying qualities of the rays and the adaptation of them to the particular fields in which they are most useful mark the source of the latest development of this method in surgical diagnosis. The volume of the Röntgen discharge is one of these qualities and depends on the volume of the secondary discharge that energizes the tube. It was a deficiency in the volume that formerly made it impossible to penetrate the denser portions of the body with rays that would produce tissue differentiation. All substances maintain their relative opacity, but their shadowy representations vary with the length of the exposure and the quality of the Röntgen discharge. The discovery of the varying effects produced by rays discharged from a tube during different states of its vacuum led Professor Röntgen to differentiate these states into the "soft," "medium," and "hard." A physical measurement that is fairly constant and applicable to any tube while in action is the measure of the length of the equivalent spark-gap in air in a parallel circuit. By this standard the "soft" tube will have an equivalent resistance less than 1½ inches of spark in air. The resulting negative will show differential shadows of the less dense structures, while the bones will be but slightly penetrated. The "medium" tube has an equivalent resistance of from 1½ to 2½ inches. It produces negatives of strong contrast, with some penetration of bones. The "hard" tube has a resistance above 2½ inches and produces a flat negative, without contrast, and is chiefly of value in detecting foreign bodies more opaque than bone. Leonard next describes the value of the rays as an aid to diagnosis. Under foreign bodies he emphasizes the importance of operation immediately following the localization; this is especially true in eye cases, as the magnet is unable to overcome the resistance of the dense adhesions that rapidly surround a minute fragment. His views on fractures are given in another paragraph in this section. He calls attention to the fact that skiagrams cannot form a basis for awarding damages in law cases, as they do not depict the damage done to the soft parts. The value of the rays in orthopedics, aortic aneurysm, and kidney surgery (the latter may be found under a separate heading in this section) is presented. Concerning the fluoroscope, he says it is of value in detecting abnormal motion and in confirming observations made by other methods. Gross variations are readily detected. It is not possible to detect the lesser, incipient pathologic variations from the physiologic normal, or one pathologic condition from another.

In discussing **radiography,** von Bergmann[2] speaks of the improvement brought about in the treatment of fractures of the patella by the use of the Röntgen rays. The use of the rays has also demonstrated that the callus uniting the fragments of the patella after operations is of a bony nature and not fibrous. The general treatment of fractures of the patella in his clinic is by operation. The x-ray has also frequently demonstrated fractures about the ankle-joint which would otherwise have been diagnosed as sprains.

[1] Jour. Am. Med. Assoc., July 21, 1900. [2] Lancet, Aug. 11, 1900.

OBSTETRICS.

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PRELIMINARY AND GENERAL CONSIDERATIONS.

Medullary Narcosis in Obstetrics.—[Probably the most interesting topic to obstetricians generally during the past year has been the question as to the utility of cocainization of the spinal cord in obstetric surgery as first recommended by Bier. The discussion has waxed animated at times and distinguished writers have placed themselves on record as for or against the method, and for reasons satisfactory to themselves if not to others. An editorial in the "New York Medical Journal," July 28, 1900, expresses the status of the method to-day just as truly as on the day it was written. It may probably be said that anesthetization of the lower parts of the body by means of cocain-injections into the lumbar portion of the vertebral canal has passed the strictly experimental stage; nevertheless, its precise advantages and disadvantages have yet to be established. It is true that Tuffier [1] has reported more than 60 cases of its employment in various operations on the lower limbs, the rectum, the perineum, and the genitourinary organs, but, although his results have been satisfactory, and although he thinks the after-effects in the form of headache, nausea, vertigo, etc., are not serious objections to its use, it seems to us that far greater experience is necessary before we can recognize the practice as one to be regularly adopted.] The intraspinal injection of cocain to relieve the pains of labor has been put to the test by Kries [2] in the clinic of Professor Blum, of Basle. A history is given of 6 cases in which the anesthesia was successful, although the nervous excitement of the patients was not apparently influenced. [Perhaps one-half of all who submit to this exhibition of cocain suffer from unpleasant collateral or subsequent effects, especially headache, vertigo, and nausea, with or without emesis.] Kries exhibited the drug in the manner recommended by Bier and Tuffier, injecting 1 centigram of cocain within the membranous sac which invests the cord; the point selected for injection was the space between the fourth and the fifth lumbar vertebra. From 5 to 10 minutes was required for the production of anesthesia, which extended up as high as the costal arch. The motility of the expulsive force of the uterus was not impaired by the action of the drug. Palpation showed that the pains occurred in normal force and frequency. The sensibility to pain, on the

[1] La Semaine Méd., May 10, 1900. [2] Centralbl. f. Gynäk., July 14, 1900.

other hand, was completely abolished, the only sensation being one of tension. The patients made no attempts to seize objects for the purpose of bearing down. The third stage of labor appeared to be in no wise influenced by the anesthesia. The usual after-pains were present because the effects of the cocain pass off by the time these sensations are due. Kries concludes by expressing his belief that the most promising field for the new anesthesia is in forceps-operations and version cases as a substitute for chloroformization. In this country, S. Marx,[1] of New York, is probably the most enthusiastic advocate of the method. He describes some interesting experiments conducted by him at the New York Maternity Hospital. He applied the method of Tuffier to mitigate the pains of labor. Tuffier performed operations after partially anesthetizing the patient with cocain injected into the subarachnoid space. Marx conducted his experiments by making aseptic the skin of the patient's back from the coccyx to the middle of the dorsal vertebræ. A needle, about 10 centimeters long, attached to the hypodermic syringe, was inserted half an inch in front of and just outside the fourth lumbar vertebra. Puncture was made between the third and fourth or fourth and fifth vertebras. The needle was pushed downward until the spinal fluid was seen to run. Ten minims of a cocain solution, representing $\frac{1}{6}$ grain, was then injected and the needle withdrawn. Aseptic precautions were employed throughout. The suffering of labor was greatly lessened, and it was possible to apply forceps and perform version without further anesthesia. General disturbances, such as nausea, vomiting, severe headache, throbbing and fullness in the head, slight increase in the pulse-rate, chilly sensations, and elevations of temperature up to 103° F. on the evening of the day of operation, were noted. This was not thought to be due to the cocain, as these symptoms followed the injection of saline solution. Nitroglycerin and morphin were used in some cases to control them. The effect followed the injection in from 7 to 12 minutes, and lasted about 3 hours. When the remedy acted sufficiently, there was no spontaneous bearing down. On command, the patient brought her abdominal muscles into play. The uterus contracted normally, and no evidences of relaxation or tendency to hemorrhage were observed. In one case the patient received $\frac{1}{2}$ grain of cocain in less than 7 hours because of retention of the placenta, it being finally necessary to peel off the placenta to deliver it. This patient made, like the others, a good recovery. Marx at this time tried the method in 8 cases without apparent danger. His subsequent experiments, now numbering over 40 cases, have still further increased his belief in the value of the method. He admits the possibility of two dangers—collapse from cocain and sepsis from the puncture. No greater disposition to hemorrhage than is found in ordinary cases was noted. A very useful point mentioned is that in order to further the absolute success of operating perfect quiet is necessary. Sight and hearing are unusually acute in these women, and apprehension is ever present that they may suffer. The eyes of the patient should be snugly bound and the ears plugged

[1] Med. News, Aug. 25, 1900, and Med. Rec., Oct. 6, 1900.

with cotton. Grandin [1] advises conservatism because there is reason for believing that there has already been an appalling mortality. He has in his possession statistics well vouched for which show 5 deaths in 100 cases of lumbar puncture, while anesthesia was secured in only 17 % of the cases. He has had 2 cases in his own practice, both of which were failures so far as anesthesia was concerned. Doléris,[2] on the contrary, claims excellent results in labor cases, and even insists that the spinal injection of cocain acts with certainty on the motor nerves of the uterus and forms a new method of inducing labor. He has had no accident in 78 cases. Porak [3] has had 4 failures in 10 cases. F. Dumont [4] reports a fatal case following the use of the injections, while Bier and Engelmann [5] record serious symptoms, including deep collapse and immediate high elevation of temperature, from its use. H. Ehrenfest [6] calls attention to the remarkably large percentage of forceps deliveries following the injections, which would seem to indicate a loss of muscular power induced by the action of the cocain, and expresses his doubt as to the safety and advisability of the method. Hawley and Taussig [7] state that vomiting occurred in 70 % of their cases (21 in number) within 10 minutes of the injection, and a rise of temperature to 101°–102° F. was noted in most of the cases. In 5 cases the cocain seemed to have a toxic effect upon the child, inducing asphyxia and depression of the pulse-rate; one child died, although it was congenitally weak. The perineal body did not seem to relax as well as under chloroform. The authors seem to prefer chloroform to the spinal anesthesia, and doubt if the latter will ever come into general use. [While these experiments are of decided interest, further investigation will be needed before this method of treatment can be brought into general use. They draw attention to one interesting fact, that uterine contractions are not in proportion to the amount of suffering which the patient experiences, and that the doing away of suffering does not lessen the uterine contractions. It is a familiar fact to all obstetricians that complete or partial anesthesia removes the inhibitory power of the cerebrum and often strengthens uterine contractions. With regard to the future scope of this anesthesia, we believe it will never become universally employed, because the frame of mind of the nervous excitable puerpera, based on fear and anticipation rather than pain, is not to be reached in this way. For this class chloroform is probably indicated. Another class of cases in which cocain would be contraindicated is represented by patients who depend much during labor on reflex bearing-down and abdominal effort. In this class, the cocain, by arresting this accessory expulsive force through abrogation of the pain which excites it, appears to be a meddlesome resource. A theoretic danger, which, of course, applies to surgery as well as obstetrics, is the possible introduction of germs within the vertebral canal. The strictest asepsis must prevail.]

[1] N. Y. Med. Jour., Nov. 3, 1900.
[2] Lancet, Mar. 2, 1901.
[3] Gaz. Hebdom. de Méd. et de Chir., Feb. 3, 1901.
[4] Correspondenzbl. f. Schweiz. Aerzte, 1900, No. 19.
[5] Münch. med. Woch., Sept. 4 and Oct. 30, 1900.
[6] Med. Rec., Dec. 22, 1900.
[7] Med. Rec., Jan. 19, 1901.

Decreasing Birth-rate in Europe.—[New statistics demonstrate the fact that in all the countries of Europe, with the exception of Russia, the percentage of increase by births has been diminishing since 1891, the average decline being 3%. The greatest difference is shown by England, where births have receded from 34% to 29.1%, and the smallest by Norway, namely, 0.1%. From 1871 to 1875 the increase by birth in Germany was 39.9%, but in 1891–95 this had sunk to 36.3%, and in the year 1897 it went down to 36%. The general average from 1881 to 1885 was 36.8%, but is now 36%. More noteworthy is the decrease in Austria, where in the course of 25 years it has dropped from 39.5% to 37.4%. In Belgium the percentage in 1871 was still 32.1%, but in 1897 only 29%; and in France the shrinkage in the same period was from 25.5% to 22.4%. Next to Norway the most favorable data are reported from Switzerland. Some recently published official statistics show a continuous decrease in the Berlin birth-rate, which is now only 29 in 1000. The number of children born during the period covered by the statistics was 450,000, which, if the birth-rate had been the same as in the whole of Prussia, would be 700,000.] According to an editorial in "Obstetrics," February, 1901, this decline in the birth-rate may be attributed to various factors, prominent among which are the direct intoxication of the fetus from the use of liquor by pregnant women, the weakening of the vital forces from alcoholic drinks, and the remarkable movement of the people from the rural and small-town districts to the large cities. The effect of city life upon the class of people which get no country outing in successive years is disastrous. It has been stated that the average life of a family living constantly in large cities without intermarriage with fresh country blood is something less than five generations.

Pregnancy Subsequent to Double Salpingooophorectomy.—Dorland, in an editorial in the "Philadelphia Medical Journal," April 13, 1901, remarks that occasional reports of gestation in a woman from whom both tubes and ovaries had been removed temporarily awaken speculations as to the cause of the phenomenon. The papers of Morris,[1] Leonard,[2] and Kossmann,[3] direct attention again to the subject. Morris reports an instance, and culls from the literature a number of other reported cases, the most remarkable of which is that described by a German surgeon, the pregnancy resulting in a tube implanted in the vaginal vault after hysterectomy. It is not at all improbable that in some such manner first arose the supposition as to the existence of a third ovary, it being at once admitted that gestation could not occur without the presence of ovarian tissue from which a Graafian follicle has been developed and an ovum discharged. In a certain small percentage of female pelves that have been examined postmortem undoubted instances of a third ovary have been noted. According to Biegel, supernumerary ovaries have been found 23 times

[1] Boston M. and S. Jour., Jan. 24, 1900.
[2] Va. Med. Semi-Month., July 13, 1900. [3] Münch. med. Woch., No. 10, 1900.

in 500 bodies; in a case reported by Winckel there were three ovaries and three ovarian ligaments. A further search must be made, however, in order to arrive at a definite conclusion as to the cause of these curious, and at first sight almost impossible, pregnancies occurring in women in whom no such additional ovary could be discovered. Excluding the existence of a third ovary, two other factors must be taken into consideration, namely, the retention of a portion of healthy ovarian tissue after excision of both organs, and a repatency of the Fallopian tubes after ligation. The case of tubal pregnancy already referred to occurred in a patient in whom the uterine appendages were retained and carried down to the vaginal vault, and, their function not being interfered with, gestation was quite possible. Of recent years there is a marked reaction in the technic of abdominal section, and it is now recognized that whenever possible a portion of ovarian tissue should be retained in the pelvic cavity. An arrest of the unpleasant phenomena of the induced menopause thus results, in consequence of which the patient is more comfortable and the natural phenomena of the period of sexual activity continue. This retention of normal tissue is, of course, a necessity for the occurrence of a subsequent pregnancy, provided a third ovary does not exist in the pelvic cavity. It is not necessary that the ovarian fragment should occupy its normal site; a piece of cortical tissue transplanted to the uterine fundus or implanted in the broad ligament can just as surely functionate. In order for the discharged ovum to find access to the fertilizing element, however, a patent condition of the Fallopian tube is essential. In fact, according to Fränkel, the difficulty lies not in securing firm ligation of the oviduct, but in preventing a subsequent restoration of the lumen of the stump. Not only has every variety of ligature employed by him to secure accurate apposition of the walls of the tube failed to accomplish its purpose, but even after resection of a portion of a tube and the use of the thermocautery the tube has again become patent. Only after total exsection of the oviduct from the uterine fundus with closure of the wound by a peritoneal flap did he succeed in permanently obliterating the opening into the pelvic cavity. When the foregoing fact is borne in mind, and it is also noted that in a very large number of abdominal sections, as now performed, a fragment of ovarian tissue is intentionally retained, the wonder is not that subsequent pregnancy should occur, but that it should occur so infrequently. This possibility of retained fecundity opens up a new question in the agitated subject of conservative gynecologic surgery in those cases in which offspring may be desired. It will be seen, therefore, that three elements may be concerned in the development of gestation subsequent to double salpingooophorectomy, namely, the possible presence of a third ovary, the retention of a fragment of functionating ovarian tissue, and a patency of one or both Fallopian tubes.

The Mortality of Obstetric Practice at the Present Time.—At the annual meeting of the British Medical Association, W. J. Smyly, of Dublin, delivered a highly important and practical address on

"Maternal Mortality in Childbed." In a rapid historical survey of the subject he said that obstetricians in the past pursued their work in the face of failure little short of disastrous. In the first half of the present century the mortality, especially in hospitals, was probably greater than at any other period of the world's history. But toward the close of the '70's improvement suddenly occurred. In the Paris Maternity, for example, the mortality dropped in 1 year from 8% to 4%, and in 1881 to 1%, and has since improved. At the Rotunda Hospital during the period 1870-1876, 1 in 45.5 women confined died; from 1890-1896, 1 in 181.7. In 1870 antiseptic principles were first applied to obstetrics, but the original system was too cumbrous for general practice. Then the spray was replaced by the douche, and the vagina was douched before and after every labor; soon the uterus was included in the process. But accidents and even death, due to injection of air or antiseptic fluid into the veins, began to multiply, and even an outbreak of puerperal fever was traced to the douche in the Berlin Charité Hospital. Leopold showed that by thorough disinfection of the external parts and avoidance of unnecessary examinations better results were obtainable than by prophylactic douching. The teaching of Semmelweiss and Sir James Simpson, that infection is chiefly carried by the hands of the attendants, is now generally accepted. No handling, no sepsis, was not far from true. Leopold has shown that patients delivered without vaginal interference made better convalescence than under the most scrupulous antiseptic precautions. Both experience and bacteriology showed that absolutely aseptic hands could not be insured by any known process. The best practice was to substitute external examinations for the vaginal, which Smyly claims is the most important advance in modern midwifery. [It is impossible to exaggerate the far-reaching importance of this statement, which is a direct impeachment of the current practice in obstetrics all over the world, of a procedure which must be performed hundreds of thousands of times every day, and to which every pregnant woman is exposed, and this by a past master of the Rotunda Hospital, speaking with all the authority of the great Dublin School of Obstetrics and at the most important medical congress in the British Empire.] But Smyly goes further and claims not only that external examination is safer than vaginal, but also that it is more useful in diagnosis. At first he found it difficult to believe this, having for years practised the ordinary method. By external examination the presentation and position of the fetus, whether it be living, dying, or dead, may be ascertained and the course of the labor followed. Pelvic deformity is suggested by pendulous abdomen, abnormal mobility and obliquity of the uterus. In prolonged labors maternal danger is indicated by thickening of the upper and thinning of the lower uterine segments, elevation of the contraction-ring, and prominence of one or both round ligaments.

THE PHYSIOLOGY OF PREGNANCY.

The Determination of Sex.—An editorial [1] remarks that some day, perhaps, we may fully understand the mechanism underlying the determination of sex, but at the present time we must acknowledge the existence of certain deficiencies in this respect. Many hypotheses have been proposed, but no one satisfies all of the conditions, although each may contain some element of truth, and be based on the observation of some actual factor. Even apart from this circumstance, however, it seems probable that the process is not simple, but is dependent upon a complexity of influences, at least some of which have been individually pointed out. On the basis of general knowledge, it seems probable that each parent contributes something in the determination of the sex of the offspring, and it appears likely that the final determining factor must be referred to some peculiarity in nutrition, affecting the spermatozoid, the ovum, or the embryo, alone or severally. From this point of view, the hypothesis of Schenk would be most acceptable, though even it must be considered as crude and not sufficiently comprehensive.

At a meeting of the Obstetrical Society of London, E. R. Dawson [2] read a paper on **"The Essential Factor in the Causation of Sex,"** in which he took the ground that each ovary normally discharges ova independently of and probably alternately with the other, normal single pregnancy resulting from the fertilization of an ovum from one ovary only by the combined secretion of both testicles, the male parent thus not influencing the sex of the child, which depends rather on the ovary that supplies the ovum fertilized; if the right, a male; if the left, a female. Illustrative cases are cited in support of the view propounded. In the case of plural births, the sex of the children would be the same or different accordingly as the fertilized ova were derived from one or both ovaries. Apparent exceptions to the rule are ascribed either to the grasping by the tube on one side of the ovary on the other side, or to the transmigration of ova. [This hypothesis is not entirely new, nor probably is it correct. It seems most unlikely that the spermatozoid should be wholly without influence in sex-determination, and it is scarcely more likely that what might be designated the accident of the situation of the ovary on the right or left side should have any decisive influence in this connection. As a matter of fact, some animals possess but a single ovary. The conclusions of the latest German writers, however, are that the sex is already decided in the ovary, as has been conclusively shown for bees and certain lower forms of life. The only means, then, by which the determination of sex can be influenced is by the nutritional processes in the ovary. Disturbances in the ovary in this line, dating possibly from fetal to infant life, seem to determine a preponderance of male ova, while abundant, normal nutritional processes favor the production of females. Ploss has noted a coincidence between the higher prices of provisions and the larger number of boys born. Schenk, on the other hand, considers the female offspring the evidence of nutritional disturb-

[1] Jour. Am. Med. Assoc., Mar. 9, 1901. [2] Brit. Med. Jour., Dec. 15, 1900, p. 709.

ances, as several mothers of boys gave birth to girls after symptoms of diabetes were first observed, which was the origin of his famous method of sex-determination.]

Superfecundation and Superfetation. — An editorial in the "Canadian Practitioner and Review," August, 1900, remarks: "By **superfecundation** is meant the separate impregnation of two ova discharged from the ovaries within a short interval of one another. It is a well-recognized fact among breeders of animals, and there are enough instances in which a negress has given birth to a black child and a mulatto, or a white woman to a white child and a mulatto, to prove its occurrence in the human female. But, as Spiegelberg points out, in such cases it is possible that in the twins resulting from such a cross one might resemble the father and the other the mother. Some obstetricians have thought that superfecundation accounted for most twin pregnancies, but this is negatived by the fact that there is commonly but one placenta. By **superfetation** is understood the impregnation in a woman already pregnant, after the first pregnancy has lasted some weeks or months, of a second ovum belonging to a second ovulation. To render this possible, ovulation must occur during pregnancy. It has been proved beyond question by Löwenthal, Slavjansky, and others that ova are occasionally discharged during pregnancy; but can they find their way into the uterus and become fertilized? It is certain that the ovum does not fill the uterine cavity during the first 2 months of pregnancy, but the ends of the tubes may become blocked early in pregnancy. Cases have been reported from time to time of women giving birth to two apparently mature infants, one 3 or 4 months after the other. But it is probable that either the woman possessed a double uterus, or else the pregnancy was a twin one, and the development of the two children, born at different periods, was not carefully compared and recorded. Marked difference in development is often noted in twins born at the same time, and two children may attain to the same degree of development in very varying periods of time." [Superfetation must be regarded as still "not proven."]

The Set of the Pelvis in the Body.—Barbour[1] read a paper upon this subject before the Edinburgh Obstetrical Society. In antero-posterior curvature there is a marked inclination of the brim which affects the set of the pelvis in the body. He showed a drawing of a pelvis in a woman who had never walked, and its high promontory and almost vertical brim were very noticeable. We know that the direction of the brim varies greatly in different patients who may be considered to be normal. The position of the promontory may be described by taking the distance which it stands back from the upper margin of the symphysis and the distance above the symphysis. The significance of the position of the brim is in its influence upon the engagement of the head and the expulsive force of the uterus. It becomes more important in multiparas than in primiparas. It is also important to study the relation of the abdominal axis to the pelvic axis; this has not

[1] Brit. Med. Jour., 1900, p. 1537.

heretofore been done. The inclination of the brim should be described as a perpendicular let fall from the upper margin of the symphysis on a line passing through the promontory in the long axis of the abdomen. The advantage of this method is that a fixed line within the body is taken instead of an imaginary plane without the body. The angle of divergence of the plane of the brim from this perpendicular is necessarily the same as an angle of divergence of the axis of the brim from the long axis of the abdomen. The smaller this angle, the more does the long axis of the abdomen come into line with the pelvic outlet. The range of divergence in pelves obstetrically normal is considerable, varying from 40° to 60°. While an average of 55° may be taken, it is important to know that pelves vary from this within certain limits. To apply these studies Barbour would use a diagram including the lumbar portion of the spine, representing it in the dorsal posture, and referring the inclination of the brim to a perpendicular let fall in the long axis of the abdomen, which is practically the horizontal plane passing through the pelvis. The inclination of the brim should be marked not only by a line representing the mean, but also by a maximum and minimum inclination for pelves obstetrically normal.

The Immunization of the Female against Spermatozoids.—[There is something startling in the suggested possibilities involved in recent experiments by Metchnikoff regarding a serum-method of securing immunization against spermatozoa. And yet, if we look upon the individual cells of an animal as essentially independent units, and upon bacteria as animal in character, the span from bacterial immunity to physiologic cellular immunity becomes quite short, and the analogy between the two seems natural and close.] Skutsch,[1] reviewing an article by Moxter,[2] says that since it has been found possible to immunize the lower animals by the use of a specific serum, not only against bacteria, but also against physiologic elements,—*e. g.*, white corpuscles, milk-cells, erythrocytes, ciliated epithelia, etc.,—the question has arisen, What is the normal relation of the organism to the spermatozoa, and is the relationship changed when spermatozoa have been taken into the body by resorption? According to Metchnikoff, sheep spermatozoa in normal salt-solution injected into the peritoneal cavity of a guinea-pig lose their mobility very much more quickly if the guinea-pig has been previously subjected to a hypodermic injection of sheep spermatozoa. The sperm-cells are not dissolved, and hence we have to do, not with a spermatolytic, but with a spermatocidal process. The blood of the injected animal is not the functionating agent. Spermatozoa brought into contact with the serum of normal animals, and with that of animals treated with sheep sperm, lose their mobility in each instance in from 2 to 6 minutes; on the contrary, when the serum of animals treated as described is injected into the peritoneal cavity of normal animals, a stronger spermatocidal effect is observed than when the serum of normal animals is used. Experiments upon animals have shown that the immunizing serum seems to have no special effect upon other

[1] Fortschritte d. Med., May, 1900. [2] Deut. med. Woch., 1900, No. 4.

cells, except that it has a strong hemolytic action upon the blood-corpuscles of the sheep. The antagonistic agent contained in the immunizing secretion has not only a destructive action upon the spermatozoa, but also a specific hemolytic action. Its affinity for the spermatozoa is greater than for the blood-corpuscles, for when spermatozoa and blood-corpuscles are added to the serum the latter are not affected at all. Its affinity, however, for the spermatozoa of animals other than the sheep is comparatively very slight. In addition to the properties already named, the serum has the specific property of causing the agglutination of the spermatozoa of the sheep.

Human Placentation in its Second Stage.—Van Tussenbroek [1] remarks that human placentation has proved to be almost a perfect copy of a process which Hubrecht studied in **Erinaceus.** The primitive blood-lacunas give origin to the intervillous spaces; out of the trophoblastic septums between the lacunas the first villi develop, sprouts of mesoblastic tissue penetrating within them. After the intervillous spaces have become wider and the villi longer, the connection with the maternal tissue is loosened and absorbed, and the tips of the villi are free. This completes the first stage, which bears histologically a great resemblance to the ripe placenta except for the villi not having plump and irregular forms, and lacking the fine ramifications which are characteristic of the end of pregnancy. But macroscopically we are still at a great distance from the ripe placenta. For in this stage there is no question yet of a discoid form, the primitive placenta surrounding the total periphery of the blastocyst. Great changes must take place before the typical macroscopic form is brought about. At the basal pole of the blastocyst—the decidua serotina—the growth of the placenta must vigorously advance. At the opposite pole—the domain of the reflexa—the villi must be reduced, the intervillous spaces must obliterate, the reflexa itself must disappear, until at length the chorion leve conglutinates with the vera. From the study of a series of microscopic preparations of placentas in this stage of development, Van Tussenbroek concludes as follows: The macroscopic form of the placenta is completed about the sixth month of pregnancy. At that period the decidua reflexa has almost totally disappeared. The reduction of the decidua reflexa is the effect of mechanical pressure. The villi of the chorion, which disappear, are removed chiefly by the obliteration of the intervillous spaces between the chorion and reflexa. Nattan-Larrier,[2] after referring to the statements of Creighton and Ercolani in regard to an internal secretion of the placenta, points out that in the normal placenta of the guinea-pig little hyalin globules may be recognized lying attached to the plasmodial layer which covers the villi, or free in the blood-spaces around the villi. These vary in size from that of a nucleolus to that of a red blood-corpuscle, have a rounded form and a gray color staining blue with toluidin and eosin-orange. They are not pathologic formations, although they are more marked in the

[1] Brit. Med. Jour., Sept. 15, 1900.
[2] Compt. Rend. Soc. de Biol., vol. LII, Dec., 1900.

placenta of guinea-pigs that have been infected with Löffler's or Eberth's bacillus; they are the secretion of the placenta formed in the plasmodium of the villi, and on their way to the organism of the mother. In connection with Nattan-Larrier's observations, Letulle [1] stated that the same hyalin droplets could be seen in the healthy human placenta, both when it was developed in the uterus and when it was formed in the Fallopian tube in tubal pregnancy. They lay on the surface of the villi.

Direct Observation of the Cardiac Movements in a Human Fetus.—Rivolta [2] reports the case of a 5-months' fetus extracted from the body of a woman suffering from hemorrhage due to placenta prævia. The child was apneic and exanimate. Its thorax was opened and the pericardial sac laid widely open. For about the space of 8 minutes the heart was observed to be beating at first 24 times a minute, and later 17. Starting from the pause, the right auricle first contracted, then (immediately after) the left, both from above downward; after this there was a very brief pause and then, the auricles still being in systole, followed the contraction of the right ventricle and immediately afterward that of the left ventricle. The contractions of the four cavities were therefore not isochronous. The cardiac impulse began with the ventricular systole and reached the maximum at the height of the systole—that is, when the ventricle was empty. Probably the amount of blood in the ventricular cavity has little to do with the production of the impulse; it is almost entirely an affair of muscular contraction of the ventricular fibers. In the fetal heart in question, which was practically bloodless, there was the same impulse, the same rotation on its longitudinal and transverse axis, the same rising of the apex and dragging down of the conus arteriosus and base of the aorta, as if there were a full blood-stream in the cardiac cavities. Owing to the fact that the condition of the mother demanded attention, the mode of cessation of the fetal heart was not able to be observed.

Placental Transmission.—Joseph B. Green,[3] of the Marine Hospital Service, reports to Surgeon-General Wyman that recent experimental studies conducted by Friedrich Franz Friedmann in the Biological Institute of the University of Berlin prove the direct infection of the embryo with tubercle bacilli, without infecting the mother. Clinical evidence has tended to prove the possibility of direct transmission of tuberculosis from the male, but it has been difficult to exclude all possibility of infection through the mother. It would be easy to overlook a small focus of infection in the lungs, genital tract, or elsewhere. Friedmann has used for this purpose healthy rabbits, and has injected into the vagina of the female, immediately after copulation, a few drops of a virulent culture of tubercle bacilli, which are suspended in a slightly alkaline salt-solution. After the lapse of 6 days, before the appearance of the first signs of placental formation, the rabbit was killed, and the embryo with the adjoining part of the uterus was placed in absolute alcohol, and finally embedded in paraffin. Very fine transverse sections

[1] *Ibid.* [2] Pacific Med. Jour., Sept., 1900. [3] Am. Med., Apr. 13, 1901.

were then made perpendicular to the long axis of the uterus. The specimen was then stained according to Ehrlich's method, the tubercle bacilli assuming a beautiful rose-red color, while the tissues remained blue. The bacilli were for the most part found within the cells lining the embryo, though some were found in the coagulated fluid within the embryo, and others in the zona pellucida. Friedmann succeeded in finding the bacilli in 48 different places, which would tend to eliminate the chance of accidental occurrence or error of observation. The organs of the mother were next examined and found healthy. No bacilli were found in the mucous membrane of the uterus, and only in 2 cases were they observed in the cavity of the uterus, and then situated near the embryo. [These experiments of Friedmann correspond to the well-known clinical fact in regard to syphilis—that a child can inherit the disease from the father without the mother becoming infected.]

THE DIAGNOSIS OF PREGNANCY.

Early Diagnosis in Pregnancy.—Heil [1] speaks of the great difficulty of making a diagnosis of pregnancy before the third month. Omission of a menstrual period in healthy women, in whom the catamenia has always been regular, may be a source of fallacy, since it may be due to causes other than pregnancy. Similarly, persistence of a menstrual or quasimenstrual discharge does not exclude the possibility of pregnancy. Numerous distinguished gynecologists lay great stress on the discoloration of the mucosa of the genitals, which assumes the hue of wine-lees or lividity. Scanzoni and Spiegelberg, of a past generation, and Olshausen, Veit, Ahlfeld, and Schauta all emphasize the importance of this discoloration. On the other hand, von Braun-Fernwald denies that change in the hue of the vulvovaginocervical mucosa has any special diagnostic significance. Heil takes a middle course in attributing some significance to the color of the vagina alone in suspected pregnancy. [In many hundred women examined in obstetric and gynecologic clinics we have found the vaginal and vulvar discoloration almost a positive sign of early as well as later pregnancy.] Another symptom which is likewise dependent upon the state of the blood-supply of the genitals is the pulsation of the uterine arteries. The author has taken pains to test 53 women who had recently become pregnant, in regard to the presence or absence of this symptom. In about a third of these women no pulsation was perceptible. On the other hand, the phenomenon was obtained in women who were not pregnant. This pulsation is doubtless in evidence late in pregnancy, but the test appears to have no value in recent cases. Von Braun-Fernwald has recently studied the bearing of alterations in the shape and consistency of the uterus upon the question of the early diagnosis of pregnancy. He finds that at the end of the first and beginning of the second month the pregnant uterus is thicker on one side than on the other, perhaps even twice as thick. The larger of the two cornua

[1] Zeit. f. prakt. Aerzte, June 25, 1900.

of the uterus is also softer than its fellow. At the point at which the larger soft half of the uterus joins the smaller and firmer half, a sulcus may be distinctly recognized. Hubl, who has also observed the presence of this groove under the same circumstances, claims that its position is not constant; in other words, it is spasmodic in nature, not organic. Winter had already described an irregular contraction of the gravid uterus in the early months. Schauta, who had recognized this asymmetry, explained it by the fact of the location of the ovum in the smaller, firmer half of the uterus. Heil has recently made a thorough study of this difference in consistency. To this end he investigated 40 women pregnant in the second or third month. He was impressed with the difference in consistency rather than in asymmetry of shape. In 9 cases the left half was the softest, while in 11 the situation was reversed. Reversal of this consistency during the examination—a phenomenon obtained by Ahlfeld and Winter—was encountered 4 times. The presence of the furrow, which runs longitudinally between the halves, could be identified in a minority of cases only. Asymmetry of the early pregnant uterus has recently been made the subject of a monographic study by Piskacek. The increase in size exhibited by the uterus after conception is not uniform until after the third month. Before that period one-half of the uterus, or even the portion about one tube-angle, enlarges at a disproportionate rate. This asymmetry, according to Piskacek, is not dependent upon muscular contractions. It may be either lateral or anteroposterior, and is accompanied by a difference in compressibility between the enlarged and the normal segments. [This asymmetry of compressibility will naturally suggest Hegar's sign of pregnancy, viz., softening of the lower segment of the uterus. From present appearances the asymmetry of the uterus, as described by von Braun-Fernwald and Piskacek, will prove to be a valuable early diagnostic sign of pregnancy.]

Individual Signs of Pregnancy.—O. Naegele [1] has observed that women who have previously suffered from phlebitis or thrombosis of the veins of the lower limbs, especially in the saphenas, have a prompt and reliable pregnancy barometer in their varix. Some multiparas can affirm their pregnancy in 8 days after conception from the condition of their varix. As a rule, the most valuable personal symptoms are malaise, nausea, vertigo, toothache, and salivation. Women who have had puerperal complications with exudates and the formation of adhesions frequently experience a revival of symptoms at these points immediately after conception, the *locus minoris resistentiæ* proving an index of pregnancy. In 2 cases a thrush-formation was noted on the external genitals, causing pain on urinating. Naegele calls attention to the valvular formation at the external orifice of the urethra in women, which forms a right-angled closure with a slit in the middle. It is most pronounced in virgins and in persons who have never masturbated.

To Determine the Obstetric Conjugate.—R. R. Rome [2] has devised an instrument for determining the obstetric conjugate. It is 12

[1] Münch. med. Woch., June 12, 1900. [2] Med. Rec., July 28, 1900.

inches in length, and the semicircle described by the hook is 2½ inches in diameter. The shaft is hollow and oval, while the hook is round. The shaft is provided with an inch scale on one side and a centimeter scale on the other. The sliding T-bar is provided with a set-screw with which it can be made firm when necessary. The instrument is used as follows: First find the height of the symphysis, *i. e.*, from subpubic to suprapubic ligament or tissues; at about the upper third of the total height make a mark; this corresponds to the thickest portion of the pubic bone. Bring the patient well over the edge of the table, flex the knees and thighs, and support them. Lubricate the fingers of one hand, introduce them into the vagina, retract the perineum by continuous and firm pressure, lower the arm and elbow so as to give an upward direction to the fingers in the vagina. Now request the patient to raise the hips, and follow the hollow of the sacrum until the middle finger is firmly fixed on the true sacral promontory. Slide the shaft along the palmar surface of the fingers until the end *a* is made to take the place of the end of the middle finger, the latter being moved a little to one side. The shaft being held in position by the index and middle fingers, slide the T-bar toward the symphysis until the end *b* is made to press firmly on the mark previously made. Turn the set-screw and remove

Fig. 64.—Rome's instrument for determining the obstetric conjugate.

the instrument. Note carefully the number of inches or centimeters from the end *a* to the end collar nearest the end *a*. Reverse the instrument; pass the hook into the vagina with the end *d* upward and back of the pubic bone. Steady the instrument in this position while the T-bar is moved toward the symphysis until the end *c* is made to press firmly on the mark as before. Now turn the set-screw. Read off the thickness of the symphysis on the scale provided for that purpose. Loosen the screw; slide back the T-bar before removing the instrument in order to avoid bruising the soft parts about the pubic bone. Subtract the last measurement or thickness of the symphysis from the first measurement, and the difference will be the true or obstetric conjugate.

Diagnosis of the Attitude of the Fetus in the Womb by External Examination.—E. G. Zinke[1] states that the majority of practitioners are little concerned with the attitude of the fetus, yet in 9 cases out of 10 its position can be easily detected during the last 10 weeks of gestation by external means alone—viz., by inspection, palpation, and auscultation. By the first we determine the contour, size, and position of the uterus, and occasionally observe fetal movements; by palpation we locate the movements, the head and back of the fetus; and by auscultation the

[1] Ann. of Gynec. and Pediat., July, 1900.

position of greatest intensity of the fetal heart. In carrying out these observations the recumbent position is selected. The abdomen is divided by two imaginary lines into four segments: one, central, from the ensiform cartilage to the pubis; the other at right angles to the first, drawn through the umbilicus. We observe that the long diameter of the uterus is parallel with the first line; the fetus lies in this axis. Feel for fetal movements; these are caused by the feet; the head lies at the opposite pole, therefore presentation of the head or breech is differentiated. Next trace the child's back between the feet and head. It will lie to one or other side of the median line. Auscultation reveals the fetal heart on

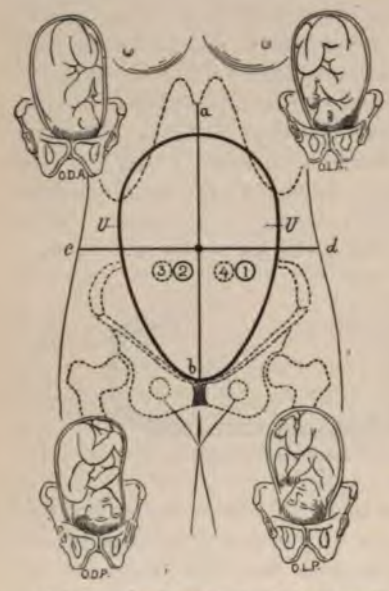

Fig. 65.—Four positions of the vertex: O.L.A., Occipitoleva anterior; O.D.A., occipitodextra anterior; O.D.P., occipitodextra posterior; O.L.P., occipitoleva posterior; 1, 2, 3, 4, site where fetal heart may be heard with greatest intensity in the various positions of the vertex presentations; solid circle indicates the sound as plainly audible; the dotted circle, as feebly audible; in the former the back of the child rests anteriorly; in the latter, posteriorly; *U*, *U*, uterus (Zinke, in Ann. of Gynec. and Pediat., July, 1900).

Fig. 66.—The four positions of the breech; D.L.A., Dorsoleva anterior; D.D.A., dorsodextra anterior; D.D.P., dorsodextra posterior; D.L.P., dorsoleva posterior; A and P, site where the fetal heart may be heard with the greatest intensity in the various positions of breech presentations; solid and dotted circles indicate the same as in figure 65; *U*, *U*, uterus (Zinke, in Ann. of Gynec. and Pediat., July, 1900).

the same side as the back, above or below the transverse line in breech or head presentation. Given these data, the other details fall into their natural position. For example, **first position of vertex**—the long diameter of the uterus is found in the long axis of the mother's body. Movements are seen and felt in the right upper quadrant near the fundus; the head will be felt behind the pubes, and fetal heart heard with greatest intensity in the left lower quadrant. Again in breech presentation, **dorsoanterior and to the left**—long diameter of the uterus as in vertex, fetal movements in right lower quadrant and posteriorly; head in right

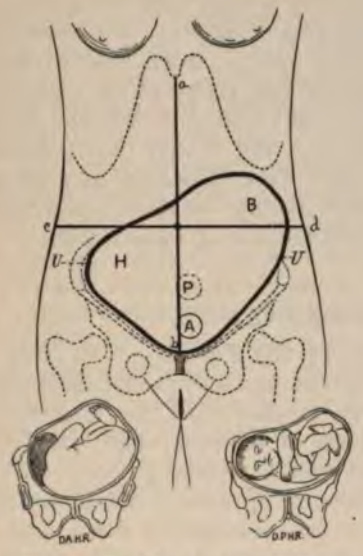

Fig. 67.—Head low variety of oblique or transverse presentations: D.A.H.R., Dorsoanterior, head to right; D.P.H.R., dorsoposterior, head to right; H, locality of the head; B, locality of the breech; A, locality of the fetal heart in dorsoanterior; P, locality of the fetal heart in dorsoposterior; *U, U*, uterus (Zinke, in Ann. of Gynec. and Pediat., July, 1900).

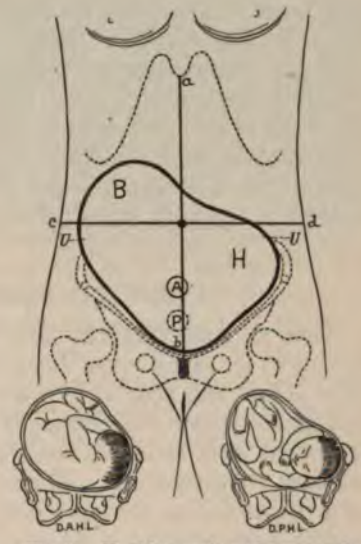

Fig. 68.—Head low variety of presentations, oblique or transverse: D.A.H.L., Dorsoanterior, head to left; D.P.H.L., dorsoposterior, head to left; H, B, A, P, same as in figure 67; *U, U*, uterus (Zinke, Ann. of Gynec. and Pediat., July, 1900).

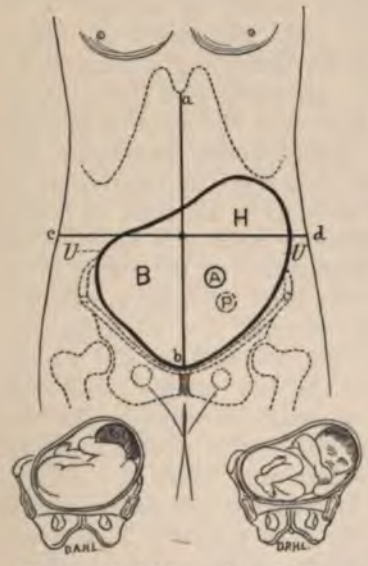

Fig. 69.—Head hign variety of oblique or transverse presentations: D.A.H.L., Dorsoanterior, head to left; D.P.H.L., dorsoposterior, head to left; H, B, A, P, and *U, U*, as in figures 67 and 68 (Zinke, in Ann. of Gynec. and Pediat., July, 1900).

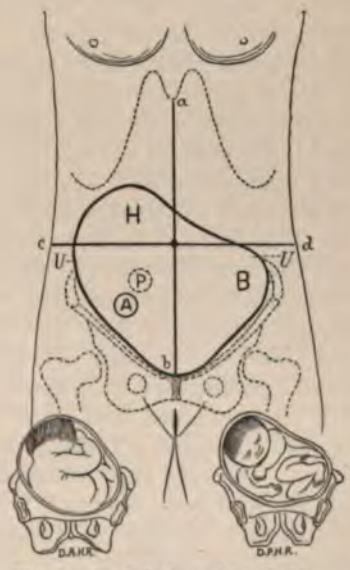

Fig. 70.—Head high variety of oblique or transverse presentations: D.A.H.R., Dorsoanterior, head to right; D.P.H.R., dorsoposterior, head to right; H, B, A, P, and *U, U*, as in figures 67, 68, and 69 (Zinke, in Ann. of Gynec. and Pediat., July, 1900).

upper quadrant at the fundus; back of child to mother's left and anterior; fetal heart in left upper quadrant. Diagnosis of oblique, transverse, or shoulder presentation: Long diameter of uterus from side to side. Example, **dorsoanterior, head low and to the right**—long diameter of uterus from side to side; head felt to right, breech to left and high up; fetal heart movements above the breech; the breech traced across the abdomen; heart just above symphysis. Face presentations prior to labor are so rare that it is not worth while looking for them; still, it is possible to diagnose them by the combined method of examination.

THE HYGIENE OF PREGNANCY.

Diet as Affecting the Development of the Fetus.—J. C. Hoag[1] states that for many years the attempt has been made to render labor less difficult and less painful by regulating the mother's diet, the idea being that under certain restrictions in the matter of food the child could be prevented from attaining the size that it would naturally reach under ordinary circumstances. There is a conflict of opinion in this direction, some maintaining that excellent results are obtainable, while others hold that the attempt is futile or attended by unfavorable results for the mother, for the child, or for both. C. S. Bacon says that "the attempt to insure easy labor by underfeeding the mother was a dream which was quickly abandoned." However, he quotes Prochownik's plan of putting the mother on obesity diet. Prochownik says that by this method he secured easy labors and living children, the latter being of normal length, but of less than ordinary weight on account of the deficiency of the fat present. Eichholz seeks the causes of difficult labor in the human race and claims that the prevailing opinion that it is due to pelvic contraction is incorrect. He holds with Lahmann that the true cause is the abnormally large fetal head, the result of improper diet. He goes on to state that if the mother, during pregnancy, lives on a nitrogenous diet, such as is usually prescribed by physicians, and especially if the dietary includes large amounts of all sorts of liquids, the child will have a large head, the amniotic fluid will be in excess, and the uterine walls will lose their contractility as the result of the consequent uterine dilatation. On the other hand, he believes that if we give the mother a food that is poor in albumin, *i. e.*, vegetable food, and limit the quantity of liquids, the fetus will be lean and its head small, the amniotic fluid not excessive in quantity, uterine contractility will be maintained, and labor will be materially shortened. Eichholz verified Lahmann's views by trying the latter's plan upon 25 pregnant women, choosing only educated persons who were likely to understand his purpose and cooperate with him in reaching the desired results. The dietary was that of Lahmann, which is as follows: Meat once a day and very little of it; green vegetables, salad, spinach, potatoes, graham bread; a little wheat bread with butter; eggs, peas, and beans prohibited as too rich in albumin; little or no soup; weak cocoa and

[1] Chicago Med. Recorder, July, 1900.

but little water; fresh fruits in abundance; no beer or wine. Under this management Eichholz obtained prompt and marked results. The general condition of the patients was excellent. They did not suffer from sensations of fullness or thirst. There was no excessive formation of fat and no constipation. Labor was rapid and easy where previously it had been prolonged and difficult. There was no excess of amniotic fluid. The quantity and quality of the breast-milk were satisfactory. The children were small but healthy, averaging about 6 pounds in weight, the circumference of the heads averaging about 33.5 centimeters. [We find many such reports as the recent one by P. Pradon, who had a patient whose two previous labors were terminated by craniotomy, the children weighing 12 and 11 pounds respectively. In the third pregnancy Prochownik's diet was used during the last 4 months of pregnancy. The result was a living child weighing 4038 grams which was delivered by forceps. The dieting of pregnant women, however, does not always give satisfactory results, and the method must be employed with much care.]

PATHOLOGY OF THE FETUS AND OF THE FETAL APPENDAGES.

Intrauterine Periods of Stress.—J. G. Kiernan,[1] in a scientific paper read before the Chicago Academy of Medicine, traces the course of embryonic development in man and in lower animals. He remarks that the fetal periods of stress of the human organism which most deserve attention are those of the senile (or simian) period of intrauterine life (which occurs about 4½ months after conception) and the period of sex-differentiation. Arrest at this period of senile intrauterine development, through any of the processes which check development, may exercise peculiar influences on the extrauterine development of the child. When produced by syphilis (which so frequently causes the senile appearance of the new-born), the child, because of organs which have undergone premature senescence, fails to pass through the first dentition or readily falls a victim to secondary infections. Precocity, whether of the intellectual or physical type, is an expression of the arrest of development at the senile period which causes the child to pass through the period of growth and senescence rapidly. Besides such obvious evidences of arrested development, minor expressions (such as the senile children described by Talbot and Souques) occur. This may involve the skin alone, the rest of the system being comparatively unaffected. Premature senility may evince itself in atheroma of the arteries at the period of extrauterine stress. This has been observed somewhat frequently in the children of vegetarians and after the essential fevers. Sex, as Dusing's biologic studies have shown, is not inherited, but is the result of various factors acting not only at the time of impregnation, but at various times thereafter. Long after impregnation, when the embryo is already developed, nutrition is still influential and may

[1] Medicine, Apr., 1901.

change the tendency even after the sexual organs have developed. Poor maternal nutrition may arrest female development, causing reversion to the male type. The psychic side of sexual differences should normally, as it often does, remain undifferentiated until adolescence. Adolescence is affected by the atavistic tendency to simian senility, which implies its early onset. This psychic side in the sex is ignored, yet the instincts which are transmitted from generation to generation (especially those so fundamental and universal as the reproductive instincts) may appear even when there is congenital absence or rudimentary development of organs upon which the manifestations depend. The psychic manifestations of the sexual appetite may remain indifferent until adolescence, like the indifferent type of sexual organs (see embryologic illustrations of "Gray's Anatomy") may be of homosexual type (to the same sex), heterosexual type (opposite sex), or may be hermaphroditic (both sexes). Three conditions (infantilism, masculinism, and feminism) and a mixed state may result from arrest of development before, at, and after sex-differentiation in intrauterine life. As the inferior organs and sex nerves are differentiated ere the psychic phase, this side of sex may be determined only in extrauterine life. Practically all three are arrests of development of the promise of the child type. Owing to the struggle for existence which occurs at puberty between the old type of the chondrocranium and its new type as supplemented by the dermal bones, the nervous system may take a distorted ply which arrests both bodily, nervous, and mental development at certain points. In infantilism the arrest is of the future promise of the child, so that body and face remain at the childish point, or body and nervous system are checked, or finally the nervous system or certain organs alone are checked while the body goes on to full development. Not infrequently the face is arrested at any period from birth to puberty. Hence many persons retain a youthful appearance through life. Often these people are vain and egotistic. The mental stamina is weak. They are frequently unreliable. The females are often sexually anesthetic prostitutes, prurient prudes, hysteric reformers, or gossip-mongers. As the female type from the standpoint of bodily and nervous development most nearly approximates the promise of the child type, checks in its development may result in masculinism and feminism. In the first the female has proceeded so far in development as to have female organs and their functions, while retaining traces of a predominant character of the lower male type. In the second the male has proceeded along the line of evolution toward the female type, but ere sex has been fully differentiated further development has been checked and the male type is finally assumed as the predominant one. Both sexes proceed, as has been shown, from an indifferent type, nearly resembling the hermaphroditic type found in the lower vertebrates. Arrest of development may therefore take place at any point in embryogeny. The male may preserve only the female breasts while normal in other respects, or again, present cryptorchidism or sloping shoulders, and be otherwise masculine. On the other hand, his nervous system may have taken

such a ply that at the period of puberty the sexual instincts are female in direction. In some instances this extends merely to extreme modesty toward males, an intense liking for female occupations, or a disgust for those of the male. In the female precisely analogous conditions may occur.

Malignant Deciduoma.—E. P. Davis and H. F. Harris [1] record an interesting case of pernicious vomiting of pregnancy which resulted fatally, after the uterus had been emptied. The patient apparently died of exhaustion. Consciousness was retained until shortly before death, the pupils were unaltered, and her one complaint was of intense headache. The diagnosis was "temporary insanity, malnutrition, and anemia." At the necropsy several large tumors were found in the cerebrum, and one in the cerebellum, as well as many smaller tumors scattered through the brain. Under the pleura of the lungs were numerous "tumor-like masses having somewhat the appearance of miliary tubercles." In the upper lobe of the right lung was an area of consolidation, about 5 centimeters in diameter, in which were a number of grayish nodules like those under the pleura. On the surface of the kidney was a large tumor. The right ovary contained a few small cysts, the left ovary being normal. The uterus was found "to be entirely normal." The liver contained a tumor 2.5 centimeters in diameter, in the upper portion of the right lobe. "The primary tumor appears to have been present in the left kidney," the authors state, and they give a full description of the microscopic appearances of this and of other growths: "The tumor proper is a curious combination of cord-like masses which greatly resemble in their composition the syncytium of the chorionic villi, along with collections of both normal and partly disintegrated blood surrounding them. These masses superficially resemble very greatly the normal chorionic villi, occurring as they do in long, villous, stringy masses that lie scattered throughout the tumor in varying numbers; but they differ from them in that they contain no blood-vessels or other mesodermal tissues." These bands contain many nuclei, and also a varying number of vacuoles, which are most numerous in the central portions of the villi. Some of the vacuoles contain cell-nuclei, others contain red and white blood-corpuscles, while many are entirely vacant. "From the foregoing description it can scarcely be doubted that the outer portion of these villous masses is composed of syncytium, and that the inner layer contains the cells of Langhans." The tumors in the brain and liver showed the same peculiarities as that in the kidney, and the so-called syncytial masses were also found in the lungs. "Sections from the uterine mucosa show the tissues to be entirely normal." The authors consider this to be a case of syncytioma maligna, more generally known under the name deciduoma malignum. "Perhaps the most remarkable feature of this case," they say, "is the entire absence of pathologic change in the uterus." [It will be remembered that the first recorded case of the disease in question, which is very rare, occurring only once in about 2000 pregnancies, was described by Sänger in 1888,

[1] Am. Jour. of Obstet., July, 1900.

under the name deciduoma malignum. The terms sarcoma deciduocellulare, chorioma maligna, syncytioma maligna, and others have been since employed by various authors in describing the hundred or so of cases which have up to the present been put on record as belonging to the same category. About 50% of all the cases followed the expulsion of a hydatid mole. While agreed as to the connection of the condition with pregnancy, its clinical aspects, diagnosis, and treatment, the various authorities are still in varying states of mind as to the origin of the new-growth. There are two main views on the subject. On the one hand, it is stated that the new formation is a variety of sarcoma developed from the connective-tissue cells of the uterine mucosa, and modified by pregnancy. On the other hand, it is affirmed that the growth is of fetal source, and has its origin in the epithelial covering of the chorionic villi.] The authors of the present paper take the latter view. Their patient suffered from persistent vomiting, and was about 2 months pregnant. They emptied the uterus, but found nothing wrong with that organ either at the time of the operation or at the subsequent necropsy. Finding, however, that the patient's body was full of malignant new-growths containing masses which "superficially resembled very greatly the normal chorionic villi," they concluded that the new-growths were derived from the fetal portion of the placenta, and decided that the case was one of "syncytioma maligna." [An English writer remarks that a more obvious conclusion would have been that, as there was no pathologic change in the uterus, the case could not be due to the invasion of the maternal organism by the fetal parasite through the walls of that organ. Those disposed to deny the fetal origin of the new-growth in similar cases might well instance this case as a proof that tumors quite apart from the uterus can sometimes "superficially resemble" placental structures. Schmorl recorded in 1897 another case in which, though the uterus was normal, tumors which he considered to be of syncytial, and therefore of fetal origin, were found in the kidneys, lungs, liver, and intestines. The present authors are not, therefore, without support in their contention that it is possible for a woman to die of metastases from a malignant uterine growth, having at the same time a healthy uterus. Persons of a more unbelieving turn of mind may be excused for considering that these cases form a sort of *reductio ad absurdum* of the whole "chorioma romance."] Smyly [1] publishes a paper on the sarcoma deciduocellulare, in which he favors the opposite view, namely, that the growths in question are sarcomatous in nature, and maternal in origin, and are modified by the occurrence of pregnancy. His summary, after Sänger, of the clinical features of the disease is as follows: (1) A birth, abortion, or hydatid mole, followed by (2) constant or repeated hemorrhages; (3) after this, and generally following an examination or intra-uterine manipulation, putrid discharges with fever; (4) increasing size and irregular shape of the uterus; (5) anemia, rapidly progressing, and toward the close intensely marked; (6) cough, dyspnea, bloody expectoration, and other symptoms of pulmonary metastases and hematotho-

[1] Brit. Gynec. Jour., Aug., 1900.

rax; (7) rapid course of the disease, which usually proves fatal within 6 or 7 months. The new-growth which invades the muscular wall of the uterus is soft and full of apoplexies; it is very friable and sloughs easily. It consists of a fibrous reticulum containing much blood and two kinds of cellular structures. These are respectively large individual cells of varied shape and struggling masses of protoplasm containing numerous nuclei, but showing no cell-outlines. Luigi Macaggi [1] relates a case of this kind very fully. The patient was aged 39, with a paternal history of cancer of the larynx; she had had 9 pregnancies, 6 at term, and 3 abortions, the eighth pregnancy terminating in this way. The last labor took place on November 1, 1895; she nursed the infant for 13 months. In December, 1896, she thought she was pregnant again; her husband had infected her with acute gonorrhea, and she had a putrid discharge with hemorrhage. In October, 1897, a diagnosis was made of "retained products, septic endometritis, pyemia, suppurative hepatitis." The patient's uterus was explored and much breaking-down material and blood-clot removed. Microscopic examination showed the mass to present all the features of a "deciduoma malignum." The patient died 7½ months after the supposed abortion. A necropsy showed a deciduoma malignum of the uterus and right ovary, with secondary nodules in the spleen, kidneys, and lungs.

Maternal Impressions.—P. B. McCutcheon [2] records the following remarkable case of seeming maternal impression. A newly married woman, brunet, and her husband, who was also a brunet, went to a museum, where they saw a male albino, which interested them both very much; in fact, made an impression upon them. They thought a great deal of him and often spoke of him to their friends. About 1 month later the woman became pregnant (she insists that she was not pregnant when she saw the albino) and in the eighth month of pregnancy she was delivered of a girl with black hair and eyes. It was stillborn, due, as the mother believes, to her carrying a heavy bundle. A well-developed boy was born 11 months later, whose hair was white and eyes pink—a perfect albino like the man they had seen at the museum. This child lived until he was 17 months old, when he died from "teething." The third child was another boy, who, like the first one, had black hair, but blue eyes. He lived 13 months and died from the effects of being scalded with hot milk. The fourth child, a girl, a perfect albino, lived a few minutes; death was due to slow delivery, as she presented by the breech. The fifth child was an anencephalous albino boy, stillborn, breech-presentation. The sixth child was an albino girl, also anencephalous; she lived a few minutes. The seventh, a boy with black hair and eyes, was well developed and lived 2 months. Death was due to colic. The eighth, an albino boy, lived a few minutes. The ninth, an albino girl, lived 3 months. This child also died of colic. The tenth, an albino girl, lived 1 year. Most probably death was due to congestion of the lungs. The eleventh, an albino girl, was born on

[1] Rassegna d'Ostetricia e Ginecologia, 1900, Napoli.
[2] N. Y. Med. Jour., July 28, 1900.

March 20, 1900, and was still alive April 21st. Thus it would seem that an impression made upon a nonpregnant woman caused defects (bodily) in her eight subsequent, but not successive, pregnancies, for we see that the first, third, and seventh children were without defects, and that there were born to this couple during 15 years, 11 children—5 boys and 6 girls—of whom 8, 5 girls and 3 boys, were albinos. Three, 2 boys and 1 girl, had black hair and eyes. There were also 4 anencephalous children. All the children died except 1 (now 1 month old). The longest time that any one lived was 17 months. The father is now 43 and the mother 39 years old, so that their child-bearing period is not yet closed, and this same impression may manifest itself upon children still to be born. The author delivered the fifth, sixth, and eleventh children, and can therefore vouch for the accuracy of their condition, and has no reason to doubt the statements made by the parents about the others and the cause which they believe produced them.

Monstrosities.—Probably the most interesting teratologic cases reported for the year are those of Chapot-Prevost.[1] He has recently

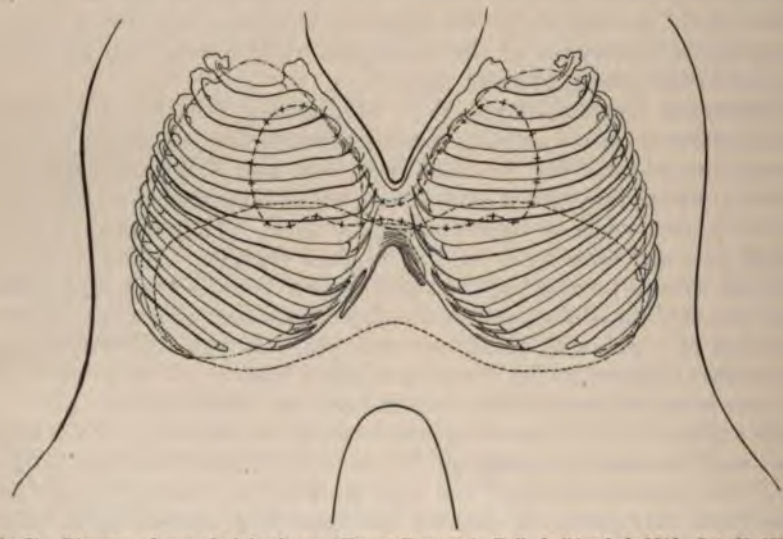

Fig. 71.—Diagram of case of xiphophagus (Chapot-Prevost, in Bull. de l'Acad. de Méd., Oct. 23, 1900).

performed a remarkable, if not unique, operation for the separation of conjoined twins. The children, both girls, named respectively Maria and Rosalina, were eight years old. A photograph shows them to be well-developed and apparently bright and happy. They belonged to the teratologic class of xiphophagi—that is, they were joined together anteriorly from the navel to the xiphoid cartilage. Nearly a year before the operation another surgeon had attempted to separate the twins, but desisted when he found the livers of the two children continuous. In October, 1899, the children were admitted into St.

[1] Gaz. Méd. de Paris, 1901, Nos. 12 and 13, and Brit. Med. Jour., Sept. 8, 1900.

Sebastian Hospital, Rio de Janeiro, where, with the help of the Röntgen rays, Prevost was able to satisfy himself that the two livers were united almost for their whole extent. By experiments on dogs he ascertained that the liver would bear extensive cutting, and how traumatic hemorrhage from that organ could be effectually controlled. The operation was performed on May 30, 1900. Knowing that until the separation was complete the two children would have to lie on the same operating table, facing each other, the one on the right and the other on her left side, but that as soon as the separation was completed it would be almost a necessity to have each of them lying on her own table, Dr. Prevost had an ingenious table constructed which consisted of two parts so joined together as to admit of instantaneous detachment. Not

Fig. 72.—Skiagraphic tracing of xiphophagus (Chapot-Prevost, in Bull. de l'Acad. de Méd., Oct. 23, 1900).

only the livers, but also the pleuras, the pericardial sacs, and the mesentery of the two children were found to be continuous. The operation, including the induction of anesthesia, lasted from 9.15 to 11.45 A. M. Rosalina made an uninterrupted recovery, and was quite well up to June 7, the date of the report. Maria, however, died of pleurisy and pericarditis on the sixth day. At the necropsy, made by the police-surgeon at Prevost's request, the liver and the external wound were found completely healed. This shows that the fatal result was not a necessary result of the operation, a view which is further confirmed by the survival of the other child. [It may be remembered that in the case of the famous Siamese twins, the fact that the livers

were united deterred surgeons from attempting to separate them during life.] Chapot-Prevost has also recently published a report of his examination of the new living Siamese twins, Liou Tang-Sen and Liou Seng-Sen. After much persuasion he was permitted to make a thorough examination of the twins, who were born in 1887, in Nankong, in a level country, and were their mother's first children. Delivery was uneventful, the father alone officiating. Seng came into the world head first, Tang feet first after his brother. At birth each child was a little

Fig. 73.—Photograph of xiphophagus (Chapot-Prevost, in Bull. de l'Acad. de Méd., Oct. 23, 1900).

under normal in size. There was one umbilical cord with only one placenta. The mother was 20 years old, the father 18; and there had been no history of twins on either side. Their mother had no children afterwards. The twins were breast-fed until they reached the age of 2½ years. The boys began to talk at 18 months, plainly only at 3 years. Both are intelligent, Tang rather more than Seng. They can sleep on either side. They had chickenpox 4 years ago, Tang taking it one day after his brother. Seng shows the scars yet. They are

always happy and hardly ever disagree. They walk and run together easily, in one direction, but when they attempt to go the other way with their other side approximated there is great difficulty, one going from left to right, the other from right to left. They were 11 years old when they left China, before which time a Scotch physician in Shanghai had examined them. Tang is 1.352 meters high, while Seng measures only 1.343 meters. A year ago each weighed 60 pounds. One can urinate at a time; one will be awake while the other sleeps; and only one may be hungry. From the various measurements, radiographs, and

Fig. 74.—Photograph of xiphophagus (Chapot-Prevost, in Bull. de l'Acad. de Méd., Oct. 23, 1900).

photographs taken, but slight difference has been found between them. The bridge which unites them is 4 centimeters long above, 9 centimeters long below. There is one umbilicus in the center of the bridge, above. As they have grown, this bridge uniting them has also grown, and they now stand further from one another than formerly. The two xiphoid cartilages join inside this uniting bridge, and below them it is probable that the liver and peritoneal cavity of each joins the other. Seng has a double inguinal hernia, Tang right inguinal hernia. Prevost calls

them the eleventh reported living case of true xiphophagus, and believes that surgical interference would undoubtedly be successful.

Wright and Wylie[1] report a case of **included fetus** (*fœtus in fœtu*), the patient being a female child aged 3 months, whose mother gave the following history: The child's abdomen had been swollen since birth, the labor being long and difficult. The abdomen had gradually increased in size and the patient had difficulty in breathing, with chronic cough. An enormous mass could be felt on the left side of the child's abdomen,

Fig. 75.—One of xiphophagous twins after operation (Chapot-Prevost, in Bull. de l'Acad. de Méd., Oct. 23, 1900).

reaching forward to beyond the umbilicus. The tumor was dull, its front and upper portion cystic and its posterior part solid; it was smooth and uniform. As the tumor seemed to have fluid contents, it was tapped, and 19 ounces of clear, yellow fluid was removed. This was slightly albuminous. The tumor then became considerably smaller, and its edges could be distinctly felt. It grew larger, however, until

[1] Brit. Med. Jour., Nov. 17, 1900.

it regained its normal size. On operation the tumor was found to have wide attachments, there being a large number of vessels in the capsule. It was removed, and efforts were made to combat the shock, which became severe. These efforts were unsuccessful, the child dying in a few hours after the operation. On examination by Ballantyne the tumor was found to be an included twin or included fetus. It was intraabdominal and of the type known as amorphous or anideus. [Some 30 cases of included fetus in the cavity of the abdomen have been recorded. The tumor is usually found on the left side, is rudimentary in character, and has very few recognizable viscera and structures within its mass. The cystic condition may be a development of the umbilical vesicle.]

P. Bolognini [1] reports the case of an infant, born after a normal labor and of healthy parents, who showed at birth a **vascular radicular nevus affecting the right upper limb.** The skin had a reddish-blue color, a peculiarity which was almost exactly limited to the territories supplied by the posterior roots of the fourth, fifth, sixth, seventh, and (in part) eighth cervical nerves; the lower anterior and all the posterior territory of the eighth were free from changes, as were also the territories of the first and second dorsal. Sensibility to touch, heat, and pain was normal, but the limb had larger measurements than that on the unaffected side, the temperature was higher, the arterial pressure was lower, the red blood-corpuscles were more numerous and the hemoglobin less in amount, and the epidermic desquamation was greater. The nevus extended also on the right side of the chest, both anteriorly and posteriorly, affecting practically all the surface supplied by the first and second dorsal nerves. The author ascribes the anomaly either to the embryonic period of development or to the fetal epoch, and hazards the suggestion that some infectious condition of the mother may have exerted an influence upon a small part of the ectoderm of the embryo or upon the nervous system of the fetus (fetal neuritis). At the same time it is admitted that no infection in the mother had been recognized.

THE PATHOLOGY OF PREGNANCY.

The Pernicious Vomiting of Pregnancy.—O. Juszkai [2] believes that hyperemesis strictly due to pregnancy is extremely rare, but that certain affections (hysteria, gastritis, peritoneal tuberculosis, meningitis) may, under the influence of pregnancy, give rise to intractable vomiting; this, however, does not have any connection with true hyperemesis gravidarum. After the exclusion of all affections followed by vomiting, and in the face of certain local symptoms (in the perimetrium), the diagnosis of pernicious vomiting may be made by marked hyperemesis occurring in the course of a pregnancy. This vomiting will be accompanied by a rapid diminution in weight, a lessening of the quantity of chlorids in the urine and of the red corpuscles in the blood; increase in the specific weight of the blood, in its alkalescence, and in the frequency of the pulse (100–110); the appearance of albumin and

[1] Pediatria, VIII, p. 413, Dec., 1900. [2] Jour. de Méd. de Paris, Nov. 11, 1900.

renal elements in the urine (nephritis from inanition) and of normoblasts and mononuclear megaloblasts in the blood; and a rapid fall of the morning temperature with increase of that of the evening to a subfebrile or feverish degree. Monin [1] has been struck by the resemblance which the symptoms presented by certain pregnant women bear to those of hypersecretion. Gastric pain, heartburn, acidity, nausea, and vomiting, occurring especially in the morning and relieved by taking food, are all symptoms commonly observed both in hypersecretion and during pregnancy. Monin believes that in both conditions the stomach instead of excreting only at the digestive periods, does so more or less continuously, although Kaltenbach and Jaffé state that in the pregnant cases no excess of hydrochloric acid is present in the gastric juice as in hypersecretion. Satisfactory results have been obtained in the case of pregnant women by administering daily 5 doses of sodium bicarbonate, each consisting of 2 grams given in a capsule. Merle [2] contributes a paper upon this subject in which he strongly advocates the **instrumental emptying of the uterus** in cases of pernicious nausea in which the patient's strength rapidly fails. He would give chloroform to obstetric anesthesia and, under antiseptic precautions, grasping the cervix with tenaculum-forceps, he would dilate the uterus with solid dilators, and with the fingers remove the ovum. He would then wash out the uterus with a solution of mercuric chlorid and tampon it with iodoform gauze. He would cleanse the uterus with an instrument, somewhat resembling a brush, dipped in a solution of bichlorid or a glycerin and creasote mixture. [While we heartily agree with Merle in his decision to operate promptly as soon as the patient's strength fails, our method of performing this operation differs somewhat from his. After dilating the uterus with solid dilators we employ the douche-curet, using normal salt solution, thoroughly sterile, or lysol, 1 %. We have endeavored to empty the uterus with the finger, but did not always find the finger long enough to accomplish the purpose thoroughly. After the uterus is emptied and douched it may or may not be tamponed with iodoform gauze. In our experience this procedure inevitably cures the nausea. It does not, however, arrest progressive weakness, which destroys the lives of so many of these patients.]

Dental Caries in Pregnancy.—Assumma [3] discusses the cause and prophylaxis of dental caries in pregnancy. It has hitherto been explained as due to absorption of mineral matter from the teeth to form fetal bone. The author asks why the maternal bones are not absorbed also, discusses the physiology and embryology of the matter, and shows that there is no foundation for this view. He investigated experimentally, giving to 50 gravid women 23 grains daily of calcium phosphate, to take the place of the supposed waste of the dental tissue; to 25 of them he gave in addition a mouth-wash of sodium bicarbonate. The latter 25 had nothing but the most trivial dental changes; of the other 25, who had no mouth-wash, 13 had caries of the molars, and 2 had

[1] Lyon Méd., Jan. 27, 1901. [2] L'Obstétrique, 1900, p. 230.
[3] Il Policlinico, Dec. 1, 1900.

intense dental neuralgia. Ptyalism is one of the frequent sympathetic phenomena of pregnancy; the buccal secretion of gravid women readily ferments, and instead of being alkaline becomes acid. All dental caries is due primarily to the erosive effects of acid secretions, permitting the subsequent growth of leptothrix. The author holds that his experiment shows that the dental caries of pregnancy is caused in the same way as other caries, but that all the factors are more active.

Valvular Cardiac Disease in Pregnancy.—G. G. Sears [1] details 15 cases in patients who were 19 times pregnant under his observation, all the gestations being successfully gone through with after a cardiac lesion was acquired. The course of these cardiac cases under the influence of repeated pregnancies is not necessarily progressively downward, since a pregnancy with severe cardiac symptoms may be followed by one in which they are scarcely noticeable; yet the net result in most instances has been a decidedly weakened heart. Six patients had mitral stenosis, 2 mitral regurgitation, 1 aortic regurgitation, 3 both mitral regurgitation and stenosis, 3 combined aortic and mitral lesions. Two patients died, 1 with mitral stenosis and 1 with a double mitral lesion. In 5 cases abortion was induced, 2 patients having mitral stenosis, 2 combined mitral and aortic lesions, 1 mitral regurgitation and stenosis. There seems indicated the necessity of inducing abortion if marked symptoms of failing compensation develop before the third month and do not respond to treatment, and of its probable necessity if they appear between the third and sixth month. The case with which patients passed through an abortion brought on before the fifth month is a decided argument for its early performance, before the mechanical difficulties from the increased size of the child have become too great. Sears has never seen reason for reproach for having advised an abortion in any case, while he has twice had reason to regret that an opinion was sought too late for premature delivery to be effective. W. A. Potts [2] states that cases have been recorded which include every variety of cardiac complication; affections of the right side of the heart, however, are very rare. Of those most frequently encountered, aortic lesions are the less serious, involving a mortality ranging from 11.7 %, as recorded by Remy, who had an experience of 17 such cases, to 23 %, as recorded by Porak, who had observed 13. When mitral disease exists, either by itself or in conjunction with aortic disease, the outlook is more unfavorable; somewhat curiously, mitral stenosis, uncomplicated by any other lesion, affords the worst prognosis of all, the mortality ranging from 46.6 %, as recorded by Sears, with an experience of 14 such cases, to 64.4 %, as recorded by Macdonald, who also had investigated 14 cases. It is in mitral disease, too, that the health of the fetus is more likely to be impaired, "both from the imperfectly oxygenated condition of the maternal blood, as well as from the destruction of portions of the placenta by hemorrhages into it from the maternal vessels." Death of the mother occurs most frequently during the second stage of labor or in the early puerperium. It is important, however, to distin-

[1] St. Paul Med. Jour., Nov., 1900. [2] Birmingh. Med. Rev., Feb., 1901.

guish the time of greatest risk associated with the different lesions. In cases of aortic disease, for the reasons to be presently explained, serious symptoms, such as dyspnea and great cardiac irregularity, develop during pregnancy, and, becoming worse and worse, reach a climax during labor; once that is satisfactorily terminated, all trouble quickly ceases. On the other hand, in mitral disease symptoms of disturbed pulmonary circulation, such as dyspnea, pulmonary catarrh, and general edema, may develop at any time during pregnancy or labor; they attain a maximum during labor, but do not necessarily abate after it is over; sometimes they develop for the first time in the puerperium. When the cardiac disease is of recent origin the risk to life is considerably greater than when it becomes chronic, because the degree of compensation will be less and there may be acute inflammatory changes in the endocardium; there is, of course, a danger of increase in the valvular vegetations that may be present owing to the increased fibrin-forming tendency in the blood, and there is a further possibility of embolism.

Pregnancy and Tuberculosis.—Bernheim [1] says that most studies of this association are based on an erroneous standpoint. It has been the custom to study the effect of tuberculosis on the course of the pregnancy and of pregnancy upon the course of the disease, but this is too narrow an interpretation of the question. The effect of gestation should be studied not only upon the actual consumptive, but also upon the candidate for tuberculosis. We should ask: Does pregnancy predispose to tuberculosis? What particular accidents does it provoke? What effect, if any, does it have upon cured tuberculosis? Reciprocally, how is pregnancy modified by the tuberculizable soil, how by the actual disease, and how by cured tuberculosis? The views which have been entertained in the past as to the relations of these two conditions vary greatly among themselves. The majority, both of accoucheurs and phthisiologists, incline to the view that pregnancy is an unmitigated evil for the tuberculous and accelerates the progress of the disease. Doléris saw an event which may not be unusual, viz., the generalization of the tuberculous process directly following delivery. In other words, the act of labor appeared to have mobilized the bacilli. But as good observers, Pinard for example, have claimed that in certain cases pregnancy appears to have arrested the progress of tuberculosis, how may this phenomenon be accounted for? Doubtless by vicious interpretation of facts. The author now discusses the course of pregnancy upon latent tuberculosis. If the woman is undeveloped, a mere child in fact, and a sufferer from unsuspected tuberculous foci in the lungs, the effect of the pregnancy would doubtless be to change the latent to an active tuberculosis. In the second case the soil is bad, but the woman has reached her full growth and development, and has a better chance of escaping active infection. Such a woman should not repeat her pregnancy, however. If the disease is already active when pregnancy supervenes, everything depends upon the stage. As a rule, in the earliest period of tuberculosis the influence of pregnancy is *nil*. The alleged aggravation

[1] Rev. Mens. de Gynécol. de Bordeaux, Aug., 1900.

of the malady is certainly often absent. The women thus affected often bear healthy children. But the more the disease has advanced, the more marked is the prejudicial effect of the pregnancy. Some good observers have stated that gestation does not influence the disease until after the fifth month. In regard to the effects upon tuberculosis of the act of labor itself, irrespective of the influence of gestation proper, all obstetricians agree that they are pernicious. Aside from the mobilization of the bacilli and the resulting generalization of the disease, authors have seen profuse hemoptysis succeed immediately to the act of expulsion. And, in general, the fatigue, shock, loss of blood, etc., incidental to parturition can but work injury to the vitality of the patient. The effects of lactation would tend in the same direction, but, of course, the tuberculous mother should never be permitted to nurse her child. Bernheim concludes as follows: (1) Pregnancy does not necessarily mean a fatal termination of tuberculosis. Latent tuberculosis is not necessarily aroused by pregnancy. Gestation in a tuberculizable woman is usually grave in proportion to the patient's growth. Young suspects should not marry too early. After recovery from suspected tuberculosis, a long period of probation should elapse before marriage is thought of. (2) The more advanced the disease, the more extensive the lesions, the graver the aggravation caused by pregnancy. (3) One pregnancy may not rouse a latent tuberculosis, but repeated gestation is almost always productive of this result. (4) During the puerperium the tuberculous woman is especially prone to show the ill effects of maternity, and she should be most vigilantly observed at this time. (5) When the tuberculosis begins to be aggravated from the very onset of the pregnancy, the physician is justified in inducing abortion. (6) A fetus inheriting tuberculosis from the father shows no peculiarity in its development.

The Mutual Influences of Pregnancy and the Infectious and Constitutional Diseases.—R. B. Preble [1] discussed this subject before the Chicago Academy of Medicine, and said it is usually considered from three standpoints: the influence of pregnancy upon the disease, the influence of the disease upon pregnancy, and the influence of the disease upon the fetus. The last aspect is the only one about which we have new information, for it is only recently that any attention has been given to this view of the question. Féré for some time has been making a series of interesting studies upon the influence of various agents on the chick embryo. He has exposed the egg in the incubator to alcohol, ether, tobacco, and various other toxic bodies, including a variety of the bacterial toxins. In this way various monstrosities have resulted similar to those obtained by shaking the incubating eggs. It seems likely that these injurious agents and the various infections and intoxications, when they act upon the embryo before the differentiation of the various organs, lead to malformations, and when they act after the organs are defined, their effects are similar to those experienced in postfetal life. For example, malformation of the heart will result from injurious influences early in fetal life, and fetal endocarditis, and from similar influences felt later in

[1] Jour. Am. Med. Assoc., Jan. 26, 1901.

uterine life. None of the infectious diseases is much altered by a coincident pregnancy. The only possible exceptions to this statement are those diseases which rapidly produce anemia, such as acute articular rheumatism, malaria, etc. The addition of such anemia to that of the pregnancy is markedly injurious. Another possible exception is that of acute yellow atrophy. This disease, undoubtedly infectious, is considerably more frequent in pregnancy and the puerperium than under other circumstances. Chlorotic women are usually sterile, but if they conceive, the anemia is intensified by the pregnancy. Women who, as young girls, have been chlorotic, often suffer a relapse during pregnancy. Pernicious anemia is made worse by pregnancy, but leukemia is not materially influenced. All of the acute and chronic infectious diseases have an injurious influence upon pregnancy and the fetus, often causing an abortion. With the exception of variola, these diseases are usually no worse when combined with pregnancy than under ordinary circumstances, but the summation of the disease and a resultant abortion are bad. Variola, which occurs somewhat more frequently during the second half of pregnancy, is often of the severer form. Abortion occurs in about 50 % of the cases; the severer the variola, the more certain the abortion. Pregnant women bear vaccination well, but the vaccination does not protect the fetus. According to Sedgwick, a fetus may have an intrauterine variola, or be born with the eruption without the mother having the disease. What is more probable is that the mother has had a variola without eruption. Scarlatina is a rare complication of pregnancy. Olshausen finds but 7 cases reported. If severe, it excites abortion. Measles is somewhat more common than scarlet fever. Underhill has collected 15 reported cases. In 5 of 7 cases, occurring early in pregnancy, abortion occurred. All of 7 patients in the last month of pregnancy miscarried early in the disease. Pregnant women show a certain degree of immunity toward typhoid fever, and this immunity increases in the second half of pregnancy, but Preble has found no evidence bearing upon the correctness of this statement. When the disease occurs, it causes abortion in considerably more than one-half of the cases. The maternal mortality from typhoid is somewhat higher than the average mortality, being 17 % of 183 cases. Malaria often causes abortion, particularly in the second half of pregnancy; according to Goth, 41 %; Weatherley, 46 %. The combination of the anemia of pregnancy with the hematolysis of malaria is particularly bad. In pneumonia, the more advanced the pregnancy, the more inevitable its interruption, and it is only when the miscarriage occurs during the ninth and tenth months that the fetus has a good chance. Cases treated expectantly give a mortality of 14.3 %; those in whom abortion is induced give a mortality of 71.9 %. Influenza, during epidemics, is often the cause of abortion. It was formerly stated that tuberculosis became quiescent during pregnancy. The opposite is true. The more advanced the tuberculosis, the more injurious the pregnancy. With advanced tuberculosis abortions are common, and if the child is born alive it is a weakling. According to Grisolle, 38 % of children of tuberculous women die, and about one-fourth of these are

stillborn. Actual transference of the tuberculosis,—*i. e.*, an intrauterine tuberculosis,—while not unknown, is decidedly rare.

Acetonuria During Pregnancy, Labor, and the Puerperal State.—I. Rousse [1] has made an extensive study of this interesting condition. Since Petters,[2] in 1857, discovered acetone in the urine of a diabetic woman who died comatose, numerous experimenters have sought to determine the rôle and origin of this substance in the body. In 1874 Küssmaul [3] stated that acetonuria is the cause of diabetic coma. Several others supported this view, which was generally received until Frerichs [4] showed that acetonuria is not constant in diabetic coma, and that it is met with in other affections. Von Jaksch [5] went still further, and proved in a series of valuable investigations that acetonuria exists normally, and although this view has been combated by several observers, it has been supported by others and has certainly prevailed. Acetonuria is a phenomenon observed normally, but does not exceed 1 centigram per day, according to von Jaksch, or 17 milligrams per liter, according to Argenson. Sometimes it becomes more marked, and may reach a half-gram per day. Then we have to deal with pathologic acetonuria, such as may occur in diabetes, cancer, chronic plumbism, hysteria, phosphorus-poisoning, certain digestive troubles, in most cases of disease with prolonged high temperature independently of the nature of the disease, in acute exanthemas, in eclampsia, and after anesthesia, etc. Pathologic acetonuria in these different conditions does not, however, constitute an important symptom, and does not *per se* furnish data for any important conclusion. If, however, we are to follow certain authors who believe that acetonuria in pregnancy is a certain sign of fetal death, it has a different import in obstetrics. But, unfortunately, acetonuria does not help us in obstetric diagnosis. In 1893 Vicarelli [6] drew attention for the first time to the acetonuria of pregnancy. In the examination of 137 women he found acetone in only 9, and these 9 were all confined of stillborn macerated children. In 2 of these cases he examined the liquor amnii, and found acetone there. Hence he thought himself justified in stating that, other causes being excluded, acetonuria constituted a new sign of death of the fetus, and this was confirmed by Knapp.[7] But, on the other hand, Mercier and Menu,[8] experimenting by the method of distillation, reached the following conclusions: (1) That acetonuria is rare in normal pregnancy; (2) that it is relatively abundant after 3 in every 4 normal confinements; (3) that it is met with once in every 2 pregnant women who have albuminuria; (4) that it is frequent in puerperal eclampsia, but is no certain sign of the death of the fetus; (5) that it occurs in morbid puerperal states, 2 cases out of 3; (6) that it is frequent after difficult deliveries; (7) that it is rare

[1] Ann. de Gynéc. et d'Obstét., Mar., 1900.
[2] Prag. Vierteljahrschr., 1857.
[3] Zur Lehre von Diabetes Mellitus, Zeit. f. physiol. Chemie, Bd. XLV, S. 471.
[4] Ueber den ploetzlichen Tod, etc., Zeit. f. klin. Med., 1883.
[5] Ueber path. Acetonuria, Zeit. f. klin. Med., 1885; Ueber Acetonurie u. Diaceturie, Berlin, 1885; Epilepsia Acetonica, Zeit. f. klin. Med., 1885; Wien. med. Woch., 1889.
[6] Prag. med. Woch., 1893.
[7] Centralbl. f. Gynäk., 1897, S. 417.
[8] Centralbl. f. Gynäk., 1897, S. 417.

after abortion; (8) that it is frequent after syphilis. Couvelain reached analogous conclusions. The discrepancies of previous observers led Rousse to undertake a new series of researches. The divergent results obtained must partly be ascribed to the want of uniformity in the tests employed and to their varying reliability. By testing carefully and systematically, and making all allowances for possible errors and fallacies and by observing a series of 53 cases, involving many hundreds of observations, he has reached conclusions which are of great interest and value. His conclusions are as follows: A slight degree of acetonuria is normal, but it is not at all characteristic of pregnancy, and its existence in the body may be purely physiologic, as several authors have already pointed out. This physiologic acetonuria is different in different persons, and varies from day to day in the same individual. It may be absent 1 day, but present on 1 or 2 days at latest in normal quantity. An increased degree of acetonuria is seen from time to time in the course of normal pregnancy for 1, 2, or 3 days without known cause, and without any accompanying symptom. Thus, in all cases in which daily analysis was made for 15 days before labor, an amount above normal was observed for at least 1 day, and often for 2 or 3 days. It occurs in irregular fashion. In 4 cases in 29 it was found on the day labor began. In most cases labor increases obviously the elimination of acetone. This occurred in 59 % of the cases observed, and the longer the labor, the greater the augmentation. In 73 % acetonuria was increased in the puerperal period for 1, 2, or 3 days, but not for more than this. Lactation has no influence on acetonuria. There is most augmentation in the labors of primiparas, and less in multiparas. Acetonuria did not seem to be affected, so far as the author's observations went, by operative interference, by fever, albuminuria, or eclampsia. But further observations on these points are needed. In 3 cases of expulsion of a dead and macerated fetus acetonuria was not above normal, but was rather less than usual, so that the observations of Vicarelli and Knapp are not supported by the author. He also found that acetone is normally present in the liquor amnii at the moment of rupture of the membranes during labor, and often it is abundant.

Albuminuria and Pregnancy.—In speaking of the evolution of the nephritis of pregnancy, Gaucher and Sergent[1] confine the term "nephritis of pregnancy" to the results of autointoxication, and exclude from the category both nephritis due to compression of the ureters by the enlarged uterus and also the results of puerperal infection. There may possibly occur during pregnancy an albuminuria due simply to blood-dyscrasia without nephritis, but this, if prolonged or repeated, must ultimately lead to definite renal lesions. Certainly, marked albuminuria may disappear completely for a time, but it tends strongly to return with recurring pregnancy, and to leave at last incurable lesions of the kidney. In other cases, in addition to albuminuria, more definite symptoms of nephritis develop, such as general edema, diminished quantity of urine with high specific gravity, the presence of tube-

[1] Rev. de Méd., Jan. 10, 1901.

casts in the urine, and uremia. Generally, after a subacute stage, or after latent periods with exacerbations in pregnancy, the symptoms become those of interstitial nephritis with high arterial tension, hypertrophy of the left ventricle, and the presence of the gallop rhythm. In the latest stages, if the patients live, the cases are indistinguishable from ordinary arteriosclerosis. The gallop sound often develops suddenly, and is believed to be the best indication of the presence of interstitialization. Postmortem the kidneys are found to vary in appearance; they may be small and red, with cysts and granulations, or large and white, without cysts or visible granulations. But in both cases they are hard and firm, and have a capsule adherent to the parenchyma. Histologically, islands of sclerosis are found. Five cases are recorded to show that interstitial nephritis may date from pregnancy. It is concluded, then, that gravid nephritis of autotoxic origin, and therefore primarily epithelial, becomes under prolonged intoxication, or after repeated attacks, a mixed nephritis, with a progressive tendency to predominance of the interstitial changes. Thus, the animal poison which gives rise to this autointoxication is comparable in its effects to mineral poisons, such as lead. J. C. Webster [1] remarks that the frequency of albumin in the urine has been variously estimated by different workers. Thus, Meyer, in 76 parturient women, found albumin in 40.78 %; Litzmann, in 100 parturient women, found albumin in 43.7 %; Löhlein, in 100 women, found it in 37 %; Flaischen, in 537 parturient women, found albumin in 16.9 %; and Winckel, in 367 parturient women, found it in 19.4 %. These percentages are noticeably higher than those given by leading French obstetricians. Thus, Pinard states that in 1249 parturient women in the Baudelocque Clinic in 1890 only 73 cases of albuminuria (6 %) occurred. Serum-albuminuria occurs in about 2 % of all pregnant women who are healthy at the beginning of pregnancy. In very many cases of albuminuria other signs of renal disease may be present. According to Winckel's statistics, in 1874, in 319 pregnant women, edema occurred in 20 %; in 1876, in 1058 pregnant women, it occurred in 4.35 %; in 1877, in 1091 women, it occurred in 6.96 %; and in 1878, in 1050 women, in 5.52 %.

Fabre [2] thus sums his conclusions with reference to the **relation between albuminuria in the pregnant woman and death of the fetus:** (1) There are cases of habitual death of the fetus due to a disease of the ovum accompanied by albuminuria, the maternal renal parenchyma remaining intact. (2) The habitual treatment of albuminuria does not prevent the death of the child whose nutrition is modified by primary placental lesions. (3) Artificial premature delivery is indicated when albuminuria appears as soon as the child is visible.

Neuroses of Pregnancy.—Bianchi [3] states that the factors which predispose a pregnant woman to neuropathy are marked. The change in disposition is often marked, there being a diminished psychic tonus

[1] Chicago Med. Recorder, Aug., 1900. [2] Lyon Méd., June 26 and July 1, 1900.
[3] L'Arta Medica, Sept. 2, 1900.

which is in accord with a general hypotonia of the muscular system. The lowered psychic tonus is expressed by melancholia, which appears to be based on fear and anxiety. Fear is an emotion which strongly inhibits the normal energy. These states of depression should diminish the natural resistance to the attacks of microorganisms. The imperious and absorbing desire of the pregnant woman for this or that object is an example which illustrates the condition of psychic instability. An idea, emotion, or desire pervades the entire consciousness. There is an absence of healthy restraint and of due deliberation. When these desires do not have full sway for their gratification, the fetus may appear to suffer in some way. Sometimes the desires and impulses are of the sexual type. Women become salacious, and some have orgasms when pregnant who ordinarily have none. The higher mentality appears to have given way to animal instinct. It happens, of course, that women already neuropathic or psychopathic become pregnant. Cases of this sort do not belong in this category because it often happens that severe nervous affections are wholly uninfluenced by pregnancy, while certain psychoses are often benefited by the latter condition. It is probably true that when a neuropath or psychopath becomes pregnant, she may be either better or worse for it, or may not exhibit the slightest change. Bianchi states that it would be impossible to enumerate all the affections of a neuropathic or psychopathic character in their association with pregnancy. With regard to chorea, he is satisfied that there is no special type of this neurosis with pregnancy, and that the alleged chorea gravidarum differs in no wise from ordinary chorea, pregnancy furnishing the neuropathic base. We may have severe cases of chorea during pregnancy, which may even be associated with mental confusion. Eclampsia presupposes a neuropathic substratum and from its analogies with epilepsy could be regarded as a neurosis in part; but Bianchi, who is a neurologist and alienist, does not claim eclampsia as properly belonging to his sphere of activity. Hysteria is a neurosis which plays a considerable rôle in pregnancy, while there are a certain number of cases of this affection which are lighted up by pregnancy. Bianchi has seen very many more instances in which a hysteric disposition appeared to be abolished by the experience of maternity. He does not even allude to the view that emesis and other phenomena of pregnancy are firmly hysteric.

Hildmoser[1] reports a case of **recurring tetany of pregnancy,** and states that tetany is more likely to be seen during lactation than in pregnancy. Frankl Hochwart, an authority on tetany, found among a large material in literature (1786–1896) 23 pregnant women, 10 patients in the puerperium, and 28 nursing mothers. In 1895 Neumann reported 2 cases of tetany of pregnancy, all that could be found in over 3000 pregnant women. He could find but 12 cases more in literature. As before said, Frankl Hochwart found 23, but he does not state the source of all his material. While the element of recurrence is present in some of the recorded cases, there is nothing in

[1] Wien. klin. Woch., July 12, 1900.

literature to compare with the great frequency to relapse in the author's patient. [There is hardly any reason to believe in a hysteric element in tetany in women. As for causes, we know that tetany is in some way bound up with the female sexual life, for it occurs in connection with menstruation, pregnancy, and the menopause.]

Persistence of Menstrual Hemorrhage During Pregnancy.—Caruso [1] states that he prefers to call this paradoxic discharge "menstrual hemorrhage," rather than "menstruation," for obvious reasons. Scanzoni was the first to show, beyond doubt, that a hemorrhagic discharge may occur periodically during gestation. In more modern times (1899) Bozzi has enlarged upon the original work of Scanzoni, and has brought it practically up to date. This author makes use of the expression, "periodic monthly crises during gestation." If we consult the works of the masters of obstetrics, together with monographs upon menstruation, we may find considerable discord in opinions. Mauriceau claimed to know of several women who always menstruated up to the fifth month of pregnancy. Velpeau thought this phenomenon had something of an epidemic quality; for example, in certain years a general tendency in this direction might be noted in a given community. Churchill personally knew of some 8 or 10 cases of the persistence of menstruation, even up to and during the months of lactation. Cazeaux had seen some women menstruate a few months; others, however, throughout the entire pregnancy. Dubois and Tarnier have seen a scanty, pale discharge persist after gestation had begun, and reappear for a few months. Opposed to these few authorities we find a great number of teachers of equal experience who deny *in toto* the possibility of the existence of menstruation during pregnancy. Such a phenomenon is for them nothing more than a simple hemorrhage from one cause or another. Numerous theories have been advanced to account for the hemorrhages and need not be detailed here. Caruso relates a personal case. A woman aged 38 had begun to menstruate at the age of 13. Married 5 years later, she became pregnant 11 times. At her fourth pregnancy she appeared to menstruate up to the fifth month; quantity, quality, and pain as in all her other menses. In the seventh pregnancy she menstruated for the first 4 months, in the eighth pregnancy for the first 6 months, etc. There were no erosions or other lesions about the os which might have caused an escape of blood. Caruso concludes that a monthly flow of blood may occur during pregnancy and may be indistinguishable from the ordinary catamenial discharge. [It is probable that a discharge of blood at the first two periods after gestation has set in is by no means a rare phenomenon, as it is cited by no less than a score of experienced obstetricians as a part of personal experience. Such a phenomenon is by no means infrequent during the first few months of pregnancy, and exceptionally the periodic flux may occur throughout the entire months of gestation. We are at present entirely unable to explain the occurrence of these hemorrhages. In the majority of these cases pregnancy and labor are normal; there is no special tendency for such patients to abort.]

[1] Archiv di Ostetricia e Ginecologica, Apr., 1900.

Fibroid Tumor in Pregnancy.—Hofmeier [1] states that upon analyzing his statistics he finds myomatous tumors equally frequent among married and unmarried women. He does not believe that the myomatous tumor itself causes sterility. From the analysis of his cases he finds that very few of these patients during the pregnant condition required especial treatment, and that in very few would he be justified in operating during pregnancy. When, however, labor comes on in these cases, should delay occur, and the patient seem threatened with exhaustion, operation should be undertaken at once. When the patient can be delivered without hysterectomy, Hofmeier has not seen grave complications in the delivery of the placenta. In 42 cases under his observation but 2 were fatal, one suddenly from dilatation of the heart or embolus, and the other of septic infection 16 days after delivery. As regards cases in which the tumor is removed and the uterus allowed to remain, Hofmeier calls attention to the statistics of Engstroem. In 22 patients operated upon in this way pregnancy occurred subsequently in 4. [Our experience coincides largely with that of Hofmeier. When the fibroid growth invades the greater portion of the uterus the physician must not expect prompt and vigorous labor, and should be prepared to operate in the interests of mother and child. When but one tumor is present, delivery through the vagina may occur in spite of unfavorable indications. Forceps and version have been useful in a number of these cases in our experience. Attention must be directed to the danger of infection, and this is especially true when the placenta is attached at or near the site of the tumor. In such a case the placenta might not be delivered spontaneously, but would become partly separated, giving rise to bleeding. Should the patient become infected during the removal of the placenta, the septic poison would enter the sinuses of the womb and a rapid and violent process result.] Wells [2] states that the gravest cases are those in which the fibroid occupies the pelvic cavity. Abnormal attachments of the placenta, postpartum and puerperal hemorrhages, and other complications may arise. Myomectomy is justifiable with small subperitoneal tumors of the fundus or any sort of fibroids so situated that they can be removed. With interstitial tumors, supravaginal hysterectomy is the operation of choice. During labor attention should be given to securing contraction of the uterus during the third stage. If postpartum hemorrhage occurs, the womb should be explored by the hand, as sometimes fibroids are found that may be easily enucleated, and the womb should then be packed with gauze. Ergot should also be used. When the tumor is at the fundus, inversion of the uterus may result, which necessitates immediate enucleation and replacement or hysterectomy. When the tumor is in the anterior wall of the womb it may sometimes be pushed out of the way with the patient in the knee-chest position. This cannot happen if the tumor is lateral or posterior. Fibroid polyps should be removed after labor to prevent sloughing. L. S. McMurtry [3] remarks that of 228 cases of labor com-

[1] Zeit. f. Geburtsh. u. Gynäk., 1900, Bd. XLII, H. 3.
[2] Med. News, 1900, p. 1028.
[3] N. Y. Med. Jour., Sept. 1, 1900.

plicated by fibroids, collected by Gusserow, more than half of the mothers and two-thirds of the children died. The assumption that many of these deaths may have been due to meddlesome interference on the part of the obstetrician is contradicted by Gusserow's carefully compiled tables. Among 147 cases of labor collected by him, 78 mothers died. Of the 61 mothers requiring manual or instrumental aid, 33 died. The remaining 48 deaths were therefore among the 86 cases not interfered with.

PLACENTA PRÆVIA.

F. D. Donohue [1] says that placenta prævia is one of the most fatal conditions with which the obstetrician has to deal, and in modern obstetric practice shows a death-rate, both fetal and maternal, greater than that of any obstetric complication. Lawson Tait, realizing the singular fatality of this complication, advised the removal of the uterus as the only safe method of treating it. In dealing with this complication Donohue dismisses the induction of premature labor before the seventh month, as it involves the certain destruction of the child's life. A rupture of the membrane followed by actual delivery, or delivery by forceps, is useful only in cases of marginal or lateral placenta when good pains are present and the os dilated. It is not, however, adapted to cases of complete prævia. Manual dilation followed by version, the method commonly advised by English and American obstetricians, has shown a steadily decreasing mortality ; this lowered mortality has been obtained at the expense of the fetus. [Cesarean section for this condition was recommended so long ago as 1892. Bernays in 1894 performed the operation upon a patient with placenta prævia who was much exhausted by loss of blood. The mother recovered, but the child died of asphyxia in 10 hours. A justification for Cesarean section is found in the success which has attended this operation both in saving the life of the mother and of the child. Notwithstanding the very favorable results in Cesarean section, it is too radical in all cases of placenta prævia, as some of them do well under conservative treatment. A certain class of cases, especially those of complete prævia, particularly in primiparas or those with a rigid os, contracted pelves, or malpositions, are those in which this operation should be employed.] Donohue reports the case of a woman 40 years of age. Six days before the expected confinement there was a sharp hemorrhage lasting 2 hours. Six days later the attending physician made a diagnosis of placenta prævia. At this time there was a flow accompanied by pains. Later in the day the hemorrhage recurred, and at 5 P. M. the patient was found in collapse. On examination the os was found to be high in the pelvis, extremely rigid, and only slightly dilated; the patient's temperature was 99.4° and pulse 140. The usual Cesarean operation was performed, the operation consuming 45 minutes. The patient and child made a good recovery, and the patient left her bed on the twenty-first day. [It would seem, if the author's deductions are correct, that section, in preference to other oper-

[1] Boston M. and S. Jour., Dec. 6, 1900.

ative intervention, is indicated in: (1) cases of complete placenta prævia; (2) cases of placenta prævia in primiparas when signs of fetal or maternal exhaustion are evident; (3) when the condition of rigid os is present; (4) when there is a history of previous operative delivery; (5) in transverse positions and in cases of prolapsed cord, if the cord is not easily returnable. It is the easiest of celiotomies, and it is also an extremely safe operation, not only for the mother, but for the child.] Fournier[1] speaks of the infrequency of the association of vicious insertion of the placenta with serious hemorrhage, and of its grave prognosis. The maternal mortality ranges from 25% to 40%. If there is no intervention, the infant mortality runs up to 70%. All authorities are agreed upon the foregoing and all counsel rapid intervention. The measures at our disposal to secure the latter are the tamponade, rupture of the membranes, use of the bags of Barnes and Champetier de Ribes, or the colpeurynter and version à la Braxton. Under the use of the above resources promptly applied the maternal mortality is rapidly sinking, and may ultimately look forward to not over 20% or even not over 10% of fatalities. [It becomes a very important question to select the best method out of these just enumerated, but we may leave out of consideration such half-expectant measures as the tampon and rupture of membranes, and the problem is then narrowed down to the best method of producing accouchement forcé. We may exclude from consideration forced delivery for other conditions, such as eclampsia and incoercible vomiting, and limit ourselves to the subject of interference in this one condition of vicious insertion of the placenta.] The author's record for the latter complication of labor is 7 cases with no maternal mortality and the saving of 4 children. The first of this series was in May, 1898, and the author here raises the question of priority. The methods employed by numerous other accoucheurs differ in some respects from the method of the author. The latter consists of two stages: (1) forcible dilation of the cervix, and (2) podalic version. Other accoucheurs each have special methods of procedure. Thus, Harris, although he turned the child, suffered it to be expelled by natural forces. The author contends that his method is logical, complete, and efficacious. His technic is as follows: Let the operator disinfect himself and the operatory field, and as a precaution have hot saline solution always in readiness for injection. If the woman is a multipara, dilate after the manner of Harris—with the fingers; or, perhaps, dilate with the fingers of both hands à la Bonnaire. If the woman is a primipara, dilate with Hegar's bougies at first and then substitute the fingers. An anesthetic should be given. When dilation has proceeded so far that the hand may be admitted, practise podalic version. Pass the hand along the placenta if it is placed laterally and through that structure if it is centrally situated. Search for the foot, obstructing the os with the forearm to prevent escape of fluid. Version must not be precipitated if we wish to save the child. If one was disposed to neglect version and leave the expulsion to nature, the presence of the placenta would prevent the en-

[1] L'Obstétrique, Nov. 15, 1900.

gagement of the head. Podalic version is necessarily indicated. After the infant is thus extracted, remove the placenta and membranes and completely erupt the uterus. Finally give an intrauterine injection of some antiseptic substance.

ABORTION.

Action of Quinin in Pregnancy.—Chambrelent and Bruyère [1] state that this question is still under discussion, and that most conflicting opinions prevail. They have therefore attempted to throw light upon the subject by undertaking certain experimental and clinical studies. A short review of the result of earlier investigators is introduced. In 1884 Rayer made the discovery (as he believed) that quinin is an abortifacient. One year later Petitjean stated that a daily dose of 1 grain is sufficient to provoke an abortion. Numerous cases were soon reported, however, in which quinin had entirely failed to influence pregnancy, even when given in large doses. On the other hand, instances were now and then published in which the abortive action of quinin was apparently vouched for in every way. Brequet, the well-known expert on malaria, states in his monograph of quinin (1855) that the drug may be given without hesitation to the pregnant woman. Conflicting cases continued to be published, and in 1872 Bartharez and Chiara undertook some researches to decide the question. They experimented on healthy pregnant women, with wholly negative results. They sought to clear up the paradox by making the malarial poison the abortifacient, while quinin, by overcoming this tendency, was rather a uterine sedative than an oxytocic. On the other hand, Monteverdi, studying especially the oxytocic action of the drug, found that contractions of the uterus were produced 30 minutes after exhibition of the remedy. The array of witnesses pro and con becomes too numerous for reproduction here. Authorities like Tarnier and Pinard obtained only negative results. The most recent student of the problem, Tarnier (1899), thought that quinin might have some oxytocic power in cases of inertia only. The clinical material of the present authors is in part as follows: (1) Women 8 months pregnant, attacked with grip. Large doses of quinin for 5 consecutive days without influence on pregnancy. (2) Women 5 months pregnant; severe malarial attack. Quinin muriate hypodermically. No influence on pregnancy. (3) Another case with negative results. (4) A very nervous woman, pregnant 5 months; influenza; about 7 grains of quinin. During the night painful uterine contractions as if threatening abortion. Quinin not repeated. No further trouble. (5) Negative results in a woman 8½ months pregnant. Large doses of quinin given as an experiment, the patient being in perfect health. The authors naturally conclude that in the great majority of cases quinin is inert as regards the uterus; but that in a small proportion of women, who are very susceptible to the action of medicines, uterine contractions may be excited.

Treatment of Abortion.—Stapfer [2] refers to a form of abortus

[1] Jour. de Méd. de Bordeaux, Mar. 11, 1900.
[2] Rev. de Kinesie d'Electrotherapie, Feb. 20, 1900.

which is evidently due to passive congestion. This latter condition expresses itself by persistent, intermittent hemorrhages. The congested uterus, rendered heavier than normal, tends to sink or change its position; it is often immobilized, while both the uterus itself, the broad ligaments, and contiguous connective tissues are edematous. In order to combat this state of congestion, sexual intercourse is forbidden, and gymnastics, with or without massage, are ordered. In the majority of cases gymnastics suffice to check the hemorrhages. The motions must be practised once or twice a day. The object of these exercises is to provoke activity of the pelvic, trochanteric, and dorsal muscles. The movements are of the "resistance" type. The woman supports herself upon her neck and heels, so that the intermediate region may undergo swinging movements. The abdominal muscles, however, must not be tense during these movements. While in this "neck-and-heel" position the woman endeavors to spread the thighs while the physician seeks to compress them ("resistance-gymnastics"). These manipulations, first invented by Thure-Brandt, are sufficient to check, or diminish, hemorrhages in the lesser pelvis. At times these gymnastics are alone sufficient to correct the congestion, immobility, and displacement; but, as a rule, massage must be superadded. This latter is simple in character, and need last but a few moments. It is made up of circular frictions and "shock" movements. The operation is bimanual, and, as carried out by the author, involves reposition of the organ when the latter is displaced. As a rule, the operation requires an assistant, but the author often dispenses with aid. Stapfer is enthusiastic in regard to the "leg-treatment," and advises it in all cases of threatened abortion.

EXTRAUTERINE PREGNANCY.

Cases of ectopic pregnancy of unusual interest are recorded as follows: Klingensmith,[1] a case in which extrauterine fetal bones were retained 17 years and finally discharged through the rectum; Urbain,[2] a case of left-sided ectopic pregnancy which ruptured in the seventh month into an associated cyst of the right ovary, and was subsequently operated upon at term; Kremer,[3] the removal of a lithopedion of 11 years' standing; Baatz,[4] rupture of an ectopic pregnancy into the bladder at the fourth month [Baatz finds 13 similar cases reported]; Doran,[5] an ectopic pregnancy occurring in the posterior layer of the right broad ligament.

Cases of recurrent extrauterine pregnancy are reported by Storer and Thurber,[6] Lewers,[7] and Varnier.[8] E. B. Cragin[9] records a case of **full-term ectopic gestation,** the fetus lying within the folds of the left broad ligament; the infant survived after being kept in an

[1] Am. Jour. Obstet., Sept., 1900.
[2] Gaz. Hebdom. de Méd. et de Chir., May 3, 1900.
[3] Münch. med. Woch., 1900, No. 42 u. 43. [4] Centralbl. f. Gynäk., No. 24, 1900.
[5] Brit. Med. Jour., 1900, p. 1535. [6] Boston M. and S. Jour., Aug. 23, 1900.
[7] Lancet, Nov. 17, 1900. [8] Gaz. Hebdom. de Méd. et de Chir., Dec. 20, 1900.
[9] Am. Jour. Obstet., 1900, p. 740.

incubator for 1 week, and 1 week in cotton. It weighed 5 pounds at birth. Cragin discusses the question as to whether an effort should be made to save the life of an ectopic fetus when viable. He urges that the child's life should receive more consideration than it has in the past. He reports 3 cases, in 1 of which he delivered by abdominal section a living child, which survived, and states his belief that by not attempting to remove the placenta at once, but by allowing it to be gradually discharged, it is possible to operate successfully in these cases, and, as this is the case, the life of the fetus should not be sacrificed in ectopic gestation. J. G. Lynds [1] has operated upon 3 cases of full-term ectopic pregnancy, all the fetuses being dead at the time of operation. B. W. Goldsborough and T. S. Cullen [2] record a case of secondary abdominal pregnancy (uteroabdominal) operated upon at term, in which there was a complete necrosis of the placenta, the latter peeling off readily and without hemorrhage.

Ovarian Pregnancy.—Anning and Littlewood [3] record a case of primary ovarian pregnancy with rupture 14 days after the last period. A rent was detected in the right ovary, and a small ovum was found loose in the clots extravasated into the peritoneal cavity. The corresponding Fallopian tube was free from any morbid condition. Bland Sutton announced that he had recently made a journey to Amsterdam for the sole purpose of seeing Mlle. van Tussenbroek's specimens of her case of primary ovarian pregnancy reported last year. On inspection of those specimens Bland Sutton became convinced that this form of ectopic gestation is possible. Mlle. van Tussenbroek lent him two beautiful microscopic sections of the whole ovary, showing the chorionic villi, etc., perfectly. Bland Sutton exhibited them at the meeting. [This is especially interesting, since Bland Sutton has hitherto most strenuously opposed the belief in the occurrence of an ovarian pregnancy. His conversion practically settles this much-disputed question.] E. O. Croft [4] reports what he believes is an instance of ovarian gestation.

Double Extrauterine Pregnancy.—Cases are reported by Boissard and Coudert [5] and C. R. Robbins,[6] while Hermes [7] and Straus [8] record cases of simultaneous tubal and intrauterine pregnancy. According to Straus, no fewer than 32 instances of tubal pregnancy coexisting with intrauterine gestation appear in literature. His own patient was 34, a secundipara; the right tube was involved, and its pregnancy had reached the twelfth week when Skäffer operated, removing the right tube and ovary. Three weeks later a fetus of about the fourteenth week was expelled. Symptoms of inflammatory pelvic mischief followed, and the patient died suddenly of pulmonary embolism 6 weeks after the abortion. In Straus's tables the maternal mortality amounts to 14 in the 32, but 10 of the 14 were in cases dating from 1820 to as far off as 1879. In 13

[1] Phys. and Surg., Feb., 1900.
[2] Am. Med., Apr. 6, 1901.
[3] Brit. Med. Jour., Jan. 5, 1901.
[4] Lancet, Nov. 17, 1900.
[5] Le Progrès Méd., July 7, 1900.
[6] Va. Med. Semi-Month., Mar. 22, 1901.
[7] Deut. med. Woch., No. 10, 1900.
[8] Zeit. f. Geburtsh. u. Gynäk., Bd. XLIV, H. 1, 1900.

cases both extrauterine and intrauterine pregnancies continued to term; in 4 both fetuses were living, and out of these 4 no fewer than 2 were cases in which both fetuses were delivered alive, the one normally, the other by abdominal section; but one mother was lost out of these 2 cases. In 3 cases one pregnancy alone continued till term, in 2 it was the normal gestation, in 1 uterine abortion occurred at the sixth week and the tubal pregnancy continued to term. In 5 cases the simultaneous pregnancies were diagnosed before uterine labor and any operation. In 9 cases the diagnosis was made after spontaneous termination of the uterine pregnancy. In 6 cases it was not made at all, being discovered at a necropsy; in 6 it was detected during abdominal section, in 2 after abortion of the uterine pregnancy, in 2 at an abdominal section after abortion, in 1 after detachment of the placenta from the uterine cavity, while in 1 intrauterine pregnancy was not detected till 2 months after the tubal sac had been removed. This is the only case in which after that operation uterine pregnancy continued to term. The child was living and was reared.

Stump-pregnancy.—John C. Morfitt [1] details a case of extrauterine pregnancy occurring in a portion of a tube, the stump remaining from an old operation for removal of ovary and tube on the right; operation was performed while the patient was in the state of collapse with all symptoms of a ruptured tubal pregnancy. Morfitt, having removed the right ovary and tube, concluded that the symptoms must be due to left-sided pregnancy, and as a preliminary step in the emergency operation removed the left ovary and tube. He then discovered in the stump of the tube formerly removed the existence of a placenta, identifying this as the seat of the pregnancy. From the appearance at the time of operation Morfitt concludes that the fertilizing ovum came from the left side, passed through the left tube and the uterine cavity up into the remains of the tube on the right side, where it finally ruptured into the abdomen. He presents the case as evidence that ectopic pregnancy is not necessarily due to mechanical or inflammatory hindrance to the normal downward passage of the fertilizing ovum.

The Causation of Tubal Pregnancy.—Glitsch [2] contributes a paper in which he reviews his cases and also the literature of the subject. He concludes that no one factor can be alleged to be the constant cause of ectopic gestation. It must be known that a predisposition is certainly present, greatly influenced and modified by intercurrent affections. Inflammation of the tube and surrounding tissues is present in most of these cases. Other causes in comparison are infrequent. This inflammation results from the action of microorganisms associated with tuberculous, puerperal, or gonorrheal processes. Of these, gonorrhea is by far the most frequent cause. Jayle and Delhern [3] publish the following conclusions to their elaborate article on the subject: Tubal pregnancy may develop either in the peritoneal cavity or in the thickness of the broad ligaments, and, by extension, in the pelvic mesocolon. After

[1] Jour. Alumni Assoc., College of Phys. and Surg., Baltimore, July, 1900.
[2] Arch. f. Gynäk., 1900, Bd. IX, H. 3. [3] Rev. de Gynéc., Feb., 1900.

the fifth month it appears that tubal pregnancy no longer presents the severe complications of the earlier months. Death of the fetus at the ninth month is not usually followed by accidents. It appears, therefore, to be wise to await the fetal decease and recession of the placental circulation. Tubal pregnancy is not often correctly diagnosticated, as it is readily confounded with tuboovarian, ovarian, or abdominal pregnancy. On the other hand, the intraligamentous variety should, as a rule, be recognized by the locality and absence of all peritoneal complications.

The Diagnosis of Ectopic Pregnancy before Rupture.—J. F. Baldwin [1] says the sharp, colicky pains, syncope, and collapse at once attract attention and point almost unerringly to ruptured ectopic pregnancy. The author, however, points out that it is dangerous to defer diagnosis until rupture has occurred, and says there are no pathognomonic symptoms of tubal pregnancy, or of any other form of ectopic pregnancy. Usually, however, we find the following points: The patient gives a history of several years of sterility (many exceptions); she has missed a menstrual period, perhaps two of them (numerous exceptions); she has noticed some unusual pains in the pelvis, which she will probably describe as boring, griping, or colicky in character, these pains being situated usually in the region of an ovary; she has, perhaps, within a few days of the time of consulting her physician, had a more or less irregular hemorrhage; perhaps has discharged pieces of the membrane which she supposed indicated an abortion owing to hemorrhage, pain, and suspicion of an existing pregnancy. Possibly, however, there has been no suspicion of a pregnancy, as the woman has accepted her sterility as incurable. On making a vaginal examination, if the conditions are at all favorable, the examiner will find upon one side or the other of the uterus, or back of it, a fusiform, well-defined cystic tumor, the size of a pullet's egg, or a little larger. This tumor will probably be tender on pressure, symmetric in outline, and distinctly pulsating. When the uterus is found somewhat enlarged, and having the feel of pregnancy, but not enlarged so much as we would expect, a presumptive diagnosis of tubal pregnancy is warranted, and the matter of an operation should be carefully and without delay considered. There are few conditions which give us the same kind of a tumor as is found in these cases. An enlarged and adherent ovary in Douglas's culdesac cannot, perhaps, be differentiated from a tubal pregnancy in the same location. An old pyosalpinx, a hydrosalpinx, a small cyst of the broad ligament, or an enlarged ovary in its normal location might be mistaken for an unruptured tubal pregnancy. It is not likely, however, that any of these conditions would be accompanied by symptoms pointing to an ectopic pregnancy, and yet they may; but all these conditions are such as to justify operative interference.

The Diagnosis of Early Ectopic Gestation with Reference to Menstruation.—Weindler [2] gives the results of his study of 50 cases

[1] St. Louis Courier of Med., Oct., 1900. [2] Arch. f. Gynäk., 1900, Bd. LXI, H. 3.

of ectopic gestation. In each of these patients the history of menstruation was carefully obtained and the curve of each case drawn with reference to this factor. Out of the 50 cases, during the first month of ectopic gestation there were 18 tubal abortions and 1 rupture; in the second month of ectopic gestation, 15 tubal abortions and 2 ruptures; in the third month, 7 abortions and 3 ruptures; and in the fourth month, 2 abortions. The remaining cases were those of pregnancy in a rudimentary cornu of the uterus. From these investigations the early interruption of ectopic pregnancy occurs more frequently as a tubal abortion, which is more common than rupture of the gravid tube, and this occurs most frequently during the first 2 months of ectopic pregnancy. A most probable cause for this condition lies in the fact that some preexisting disease of the uterus, tubes, or ovaries is present in these cases, making it impossible for the gestation to proceed further. In studying these cases the menstrual curve of the first months gives information of value. In 18 cases in which ectopic gestation was observed during the first month menstruation came on at the usual and regular time, but with increased bleeding. In other cases menstruation was slightly delayed and of increased intensity. It is of interest to observe that in many cases in which ectopic gestation lasts longer than the first month menstruation occurs in almost normal manner. In these cases the diagnosis must be made without reference to menstruation, by the detection of a tumor and the characteristic pains. When the ectopic gestation goes to the second, third, and fourth month, there is disordered menstruation, usually amenorrhea, until the time when rupture of the fetal sac occurs, and profuse internal hemorrhage. To summarize, menstruation is altered in early ectopic gestation as follows: When ectopic gestation terminates in the first month, it does so by a profuse hemorrhage at the time of menstruation at the end of the first month of gestation. When the gestation goes on uninterrupted to the second or third month, menstruation may be unaltered. Tubal abortion is not uncommon, and hemorrhage may occur at any time. When ectopic gestation persists to the third or fourth month, menstruation may cease, no hemorrhage occurring until the rupture of the gestation sac.

CORNUAL PREGNANCY.

Kehrer [1] has prepared an important monograph on uterus unicornis, including uterus bicornis with one horn obstructed. He reports 82 cases from recent medical literature, including 1 under his own observation. The patient was 28 and had borne 3 children. She had exceeded term for 3 weeks. Pregnancy in a right rudimentary cornu being diagnosed, it was amputated, and the patient again became pregnant. He divides these malformations into two varieties, connected by intermediate forms: (1) Uterus bicornis and septus bilocularis with relatively good development of the musculature and vessels of the more or less atresic, gravid, rudimentary cornu. Here that cornu undergoes

[1] Das Nebenhorn des dippleten Uterus, Heidelberg, 1900.

almost normal evolution. Rupture is rare till the seventh month, and as a rule pregnancy continues till beyond term. The pedicle is usually thick; it may contain a very narrow cervical canal. (2) Uterus bicornis and septus bilocularis, with very ill-developed rudimentary cornu. Evolution is here very imperfect, so that rupture within the first 6 months is almost certain. The pedicle is constant, and usually solid, seldom bearing a trace of a canal. As to prognosis, Kehrer finds that most cases rupture within the first 6 months; in some the fetus, dead before or at term, is retained, whilst some undergo operation. Twelve cases of hematometra in this variety are recorded; the distended cornu was never larger than a goose's egg. In 5 there was a hematosalpinx as well. In one only the hematometra ruptured, apparently between the layers of the broad ligament. When a trace of a cervical canal, patent throughout, exists, conception in the ordinary way is possible. When the pedicle is quite solid, the sperm-cell may fertilize an ovum in the opposite ovary (*transmigratio ovuli et seminis externa, seu intraperitonealis*), or may get over to the ovary attached to the rudimentary cornu and fertilize an ovum on that side (*transmigratio seminis externa seu intraperitonealis*). The pedicle was solid in 78 % of all Kehrer's cases. The right or left cornu was involved with almost equal frequency. Rupture is most frequent in the fourth month (47.6 %), as the gravid cornu has begun to rise above the protecting bony pelvis. The normally developed horn ceases to menstruate, as a rule, hypertrophies, and develops a decidua which may be cast long before the death of the fetus. Cornual pregnancy is rarely painful at first, as is the case with tubal pregnancy; rupture is often sudden and is very fatal. In 23 out of the 82 cases in which rupture did not occur, the fetus died before, at, or after term, its death usually being preceded by labor pains and active fetal movements. A cachectic condition follows. The results of operations are favorable: 45 out of the 82 patients underwent abdominal section; 39 recovered (86.7 %), 7 bore children again afterward; 2 of the 6 deaths were due to loss of blood before the operation, 4 were from peritonitis, 1 of the cases being clearly septic beforehand.

LABOR AND THE PUERPERIUM.

Sticher [1] contributes an interesting paper upon **the importance of bacteria in the vagina as a source of puerperal infection.** Reasoning from the anatomy of the vagina and the character of the tissues surrounding it, Sticher became convinced that bacteria from the skin or clothing must necessarily find access to this portion of the body. Water used in bathing must also be a possible source of contamination. To determine the latter he caused patients to bathe in water containing cultures of bacteria, and afterward proved the presence of these germs in the vagina by inoculation-tests with vaginal secretion. [While it is true that we cannot hope to exclude all bacteria from the birth-canal,

[1] Zeit. f. Geburtsh. u. Gynäk., 1900, Bd. XLIV, H. 1.

we may find a rational explanation in clinical freedom from infection in the condition of the mucous membrane. So long as this is not bruised, lacerated, and rendered edematous by frequent violent manipulation during labor, or by long-continued birth, bacteria found in the vagina are rarely the cause of infection. We can control by antisepsis the introduction of virulent germs by hands and instruments, and if we avoid injury to the mucous membrane of the birth-canal during delivery, and especially if we avoid the edema which follows long-continued pressure from delayed labor, we shall do much to prevent serious infection.]

The Value of Oxytocics.—Madlener,[1] referring to Payer's paper upon "The Influence of Sugar upon Metabolism in Pregnancy and During Labor," in which Payer records decided oxytocic effects at different stages of parturition, confirms the efficiency of sugar in cases requiring increased muscular effort, and relates his own experiments while mountain-climbing. Madlener ascribes this particular influence of sugar to its rapid absorption into the blood. No food is taken up so readily; none imparts to the system such prompt and effective stimulation as sugar. Madlener had occasion to experiment in 6 cases of uterine atony, 3 times in primary and 3 times in secondary cases of deficient uterine contractility. In 5 cases out of 6 the oxytocic influence was noticeable within from ½ to 1 hour after exhibition. Five cases terminated by spontaneous birth. He used 30 grams (1 ounce) of sugar in a half pint of water, and if necessary repeated the dose once. Two patients took more than prescribed (3 and 5 ounces respectively) without untoward effects, nausea, or vomiting. In 3 cases out of 6 Madlener noticed a decrease in the pains, coupled with increased uterine contractility, as previously set forth by Payer. He strongly urges the practitioner to take advantage of this safe, inexpensive, and effective means of furthering labor. [The value of **quinin in labor** has frequently been discussed, and many contradictory reports have been elicited. Its power to initiate uterine contractions is a much-debated question, but its value as a stimulant is undoubted; and it has frequently proved useful in maintaining general strength and good uterine contractions.] Fussel [2] has used the drug in over 100 cases and finds that it produces strong intermittent, quickly-recurring contractions, exactly resembling normal labor pains, and entirely different from the tonic contractions produced by ergot. He has found it much more useful in multiparas than in primiparas, and has never observed that it possessed a tendency to produce bleeding, although Hirst claims that in certain susceptible individuals it will occasionally cause violent postpartum hemorrhage. He administers the drug in doses of 15 grains and considers that it prevents, rather than produces, hemorrhage.

Anesthetics in Labor.—Westermarck [3] publishes the reports of a series of elaborate experiments to determine the influence of chloroform upon the action of the uterus during labor. These experiments were conducted in Stockholm, and are of great interest. He concludes that

[1] Canad. Pract. and Rev., Jan., 1901. [2] Therap. Gaz., Jan., 1901.
[3] Arch. f. Gynäk., 1900, Bd. LXI, H. 1.

complete narcosis by chloroform diminishes the frequency of uterine contractions and lengthens the interval between the pains. It exercises no influence upon the intrauterine pressure between the pains, but renders the uterine contractions shorter in duration. The intrauterine pressure is lengthened during the pain under the full influence of chloroform. The pain reaches its highest point in practically the same time as in cases in which chloroform is not given. Obstetric anesthesia with chloroform lessens the frequency of the pains. It lengthens the interval between them, exercises no influence upon the intrauterine pressure during the pains, but greatly diminishes the suffering which the pains occasion. In a small degree obstetric anesthesia with chloroform lessens the duration of the pains. It does not, however, diminish the intrauterine pressure. The highest point of the pain is reached in about the same time with or without obstetric anesthesia. [The practical conclusion of his experiments is that the use of chloroform in obstetrics should be limited to those cases in which the suffering is intense and the control of the patient becomes so necessary that it seems best to risk some prolongation of the labor in order to control them.]

Laceration of the Perineum.—An editorial in the "Clinical Review," for December, 1900, remarks that tear of the perineum, the result of labor, has been the subject of discussion before distinguished bodies of obstetricians many times, and yet no reasonably certain calculation as to the frequency of such ruptures has, seemingly, ever been put forward, or rather accepted by obstetric teachers. In a vague sort of way almost all obstetric teachers hold that a "large proportion" of all primiparas suffer one or more perineal tears at labor; and an unknown percentage, though smaller, of multiparas likewise show some rupture of the posterior lower wall of the parturient canal. These points become interesting in their bearing upon obstetric technic, and have great importance in connection with some postpartum pathologic conditions that were formerly much more feared than now. There is at present no contention among the men who have kept abreast of the times, and have been able to reason out the connection between a logical cause and an evident effect, that solutions of the surface continuity of the parturient passage, the result of labor, have been directly associated with general evidences of sepsis—that the old-fashioned "milk fever," passing on so often to "puerperal septicemia" and death, was nothing short of a toxemia made possible by vaginal or perineal tears. There are three especially worthy points of thought in this matter, viz.: (1) Can these frequent tears of the perineum be prevented? (2) What is to be done when it is known that tears have occurred? (3) How shall we manage the case so as to prevent infection, or how treat the infection if it has commenced? It is not to-day believed very generally that much can be accomplished in the way of preventing a threatened tear of the perineum, except by some retardation of the delivery-time, giving the parts more time to stretch. This retardation practically can only be insured by anesthetization of the patient, thus temporarily partially checking the forcible and rapidly-propulsive efforts of the mother. A more gradual dilation

may then take place, and if the parts are dilatable, a rupture may be prevented. But no one will long remain in obstetric practice without becoming fully convinced that there is a wide difference in the elasticity —if such a term may be used—of the soft structures concerned in parturition in different women. Some, even with large frames and roomy pelves, possess unyielding soft parts, and perineal tears result in spite of all precautions; others, even with small frames and small pelves, will exhibit very dilatable soft tissues and a first labor will go normally on to termination with no damage to the surfaces. It is quite universally held to-day that the immediate repair of all wounds of the genital parts should be undertaken after parturition. This means, of course, a careful examination in each case for evidences of injury; and such examination should not be confined to a mere inspection of the external parts, for the vaginal walls may be considerably torn and therefore need attention. The general practitioner establishing this as a routine practice will do his duty to his patient and will many times save a large amount of misery. The repair of the perineum or the approximation of vaginal tears is not at all so difficult as many think. In most cases an anesthetic is not required, the nervous sensibility of the parts having been obtunded somewhat by the strain they have just passed through. Silk or animal ligature may be used, according to convenience. The head-band and mirror will greatly help the operator when artificial light is used, and only one or two assistants need be used. The repair of the torn perineum can thus be effected at any time, in any place, and under almost any circumstances, and should therefore not be excused away. If perineal or vaginal ruptures afford the avenues of entrance to the general organism of elements of infection, then the immediate repair of these injuries constitutes at once the foremost and best means for preventing so-called puerperal infection. If puerperal infection occurs otherwise than through a distinct rupture in the parturient canal,—and it probably does occur in other ways, from what may be called direct intrauterine infection, as from an obstetrician's hands or instruments, from erosions of the vaginal mucous membrane, and from slight tears of the cervix,—then an antiseptic toilet is demanded; and inasmuch as it cannot be foretold that such accidents will not occur, it must be admitted that it is best to institute antiseptic precautions in all cases and from the very first. Great care should be observed that the hands are clean —surgically clean—and that any instrument employed about the lying-in patient be equally clean. There ought to be no necessity of going into detail here. Every obstetrician knows, or ought to know, what surgical cleanliness means, and how to carry out the same, and the purpose, in any puerperal case, of preventing infection in consummated or not by the intelligence, carefulness, and attention to detail vouchsafed by the accoucheur.

The Third Stage of Labor.—Berry Hart [1] presents a paper on uterine retraction with special reference to the mechanism and management of the third stage of labor. He points out the discrepancies

[1] Lancet, Jan. 26, 1901.

between the usual views as to the mechanism of the separation of the placenta during the third stage and the practice adopted in the management of this stage. He defines retraction as muscular action (contraction) where a part of the thickening of the muscle is retained after the contraction proper has ceased. In sections of the parturient uterus it is remarkable that the uterine wall at the placental site is thinner than elsewhere. The uterus removed by Porro's operation shows a uniformly retracted and thick wall, while uteri with the placentas still attached, obtained by postmortem examination, and thus intact uteri, have a thin wall on section at the placental site, thinner than the uterine wall elsewhere above the retraction ring. He believes that the state of the uterus after Porro's operation cannot be accepted as evidence of the amount of retraction in a normal third stage, but is an overretracted uterus owing to the longitudinal and transverse incisions necessary in the operation. Hart next draws attention to the elastic recoil of the uterus following a pain, and points out the importance of the elastic tissue in bringing this about. He finally emphasizes the great importance of the fact that the placenta is separated during the third stage by a disproportion between the placental area and the placental site, and that it follows from this that as the disproportion occurs in the elastic recoil (that is, after the pain is over), the Crédè method is a source of danger if practised during the early period of this stage before the placenta is separated. Cole-Baker [1] thought that if the placenta was situated in the upper contractile zone it could be separated only by the fact of the site becoming so small that the placenta could not adhere to it. If the placenta was situated in the lower segment, as labor proceeded the original site would become larger than the placenta and in that way he thought the two processes would come in. With regard to the retroplacental hematoma, of course it occurs in a great many cases, and its formation seemed to him to infer that the placenta was more adherent round the edges than in the center, and that the membranes were still more adherent than the edges of the placenta itself. He thought the weight of the placenta, once it was detached, was quite sufficient to invaginate the membranes without the additional weight of the hematoma behind it. The President was the first to teach him to deliver the membranes by allowing the placenta to hang from them without exerting any extra traction or torsion, and this certainly seemed most nearly to approach nature; but he found that sometimes when the placenta was extra heavy, and the membranes friable, the placenta went into the bath, and left a tag of membranes behind. He found that a very small degree of torsion prevented this, and he always used it of late, not to separate any of the membranes still adherent to the uterine wall, but to prevent them from giving way. Heard said that the retroplacental hematoma was much smaller in those cases in which the practitioner kept his hand on the uterus. He was not anxious about leaving a portion of the membranes behind. He thought the placenta should not be forcibly expelled by pressure from outside. If it did not

[1] Dublin Jour. Med. Sci., Feb., 1901.

come away within a reasonable time, it should be removed by the fingers.

Rieck [1] contributes a paper upon the **treatment of the stump of the umbilical cord and the umbilicus.** The principles which he strives to carry out are to make the cord as short as possible and to sterilize it by the application of heat. This he accomplishes by applying a silk ligature, as the cord is at first tied, as usual, some distance from the umbilicus when the child is removed from the mother. The stump of the cord and umbilicus are then surrounded by wet cotton or a moist towel, and the stump of cord cauterized by the cautery or by a pair of crushing-forceps heated in a gas flame. The cord sometimes burns rapidly, when caution must be taken that it be not cauterized too suddenly; and at other times the heat acts very gradually. The silk ligature is cut short and the very small stump remaining dressed with sterile cotton, linen, or gauze. Care is taken that a nurse or assistant holds the child firmly, so that it is not burned in any other portion of the body. The dressing is changed daily unless it adheres to the stump. It is then allowed to remain until the whole comes away. The umbilical dressing and bandage are usually not required after the tenth day. [While this method might be applicable in hospitals, it would scarcely be employed in private houses. Among the many more simple ways of treating the cord, the use of alcohol upon sterile gauze has given good results. The cord is first crushed and its Wharton's jelly as thoroughly expressed as possible. It is tied a short distance from the umbilicus and the stump wrapped in sterile gauze which has been thoroughly soaked in alcohol. It dries rapidly under this method and the umbilicus heals promptly.] Stolz [2] describes a simplified method which has given excellent results in the Royal Lying-in Hospital of Graz. The cord is cut twice, the second time being 1 hour after the first. A fine silk ligature is applied close to the skin and the cord cut through with sterile scissors 0.5 centimeter higher up. A sterile dressing is applied, which is changed every second day, and dermatol sprinkled on. [This method differs from those of Ahlfeld and Martin in that the application of alcohol and cauterization of the stump, recommended by these two authors respectively, are omitted.] Out of 500 cases it was found that the stump dropped off on an average on the sixth day, while only one instance of secondary bleeding occurred. The advantages of the method are the quickness with which the stump dries up and the minimization of risk of infection by dressing only every other day.

Bathing of the Newborn.—An editorial in the "Journal of the American Medical Association" says that the question whether the newborn should be bathed or not has occupied the attention of the Russian and German obstetricians during the last decade. Dohrm,[3] in 1880, formulated the following procedure: Having washed the umbilical cord with a 2.5% solution of carbolic acid, it is wrapped in carbolized cot-

[1] Monatsschr. f. Geburtsh. u. Gynäk., 1900, Bd. XI, H. 5.
[2] Wien. klin. Woch., Jan. 31, 1901.
[3] Arch. f. Gynäk., 1880.

ton and secured with adhesive plaster. The dressing is left on for 7 days. The child is not bathed at all. Artemyeff[1] modified Dohrm's dressing; he does not apply the adhesive plaster. Lvov[2] advised powdering the umbilical cord with 1 part of iodoform and 10 of bismuth. The child is bathed. In 1892, however, Lvov changed his opinion, and suggested another method. After the bath the cord is wiped dry, wrapped in absorbent cotton saturated with glycerin, and bandaged with gauze. The child is not bathed until the cord falls off. Doktor[3] has studied this question on 1341 newborn children. His conclusions that children should not be bathed until the cord falls off are based on the fact that such children are less liable to febrile complications, their weight is more rapidly increased, and the cord falls off earlier than in children who are bathed daily. Keilman[4] reported his observations made on 400 children and arrived at the same conclusion as Doktor, with the exception that in his cases he did not notice the difference in time of the drying up of the cord. Weinstein[5] also advised against bathing the newborn. He based his conclusions on the observation that the cord in unbathed children falls off earlier. Knopp[6] warned against bathing the newborn, so as not to infect the vagina with gonorrhea. Neuman,[7] in his report before the Berlin Medical Society, pronounced bathing of the newborn as absolutely harmful. Arthes[8] made his observations on 150 children and arrived at an opposite conclusion, as did also Czerwenka.[9] Kovarski[10] has conducted careful observations on 420 children; half of the number were bathed, and the other half were not. With the exception of a large percentage of icterus among the bathed ones there was no other perceptible difference. After summarizing the pros and cons of the subject, Kovarski concludes that no scientific proof has as yet been adduced as to the harmfulness of bathing, and that we can follow, without perturbation of spirit, the time-honored custom of bathing the newborn.

MATERNAL DYSTOCIA.

Puerperal Eclampsia.—*The Rôle of the Liver in the Production of Eclampsia.*—Dorland[11] says that there is a reaction against the late established theory of attributing all cases of puerperal eclampsia to a renal inadequacy pure and uncomplicated, as manifested by an albuminuria of varying degrees of intensity. The tendency to-day is to ascribe the convulsive seizures and albuminuria to one and the same cause, namely, the presence in the blood of a certain toxin of unknown constitution and origin. The frequency of marked hepatic lesions in autopsies on eclamptic women points to the probability of their being liberated in this organ. Pregnancy directly increases the production of toxic principles, and in cases of organic insufficiency intoxication must occur.

[1] Arch. f. Gynäk., 1887.
[2] Jour. Akush. i Jensk. Bol., 1888.
[3] Arch. f. Gynäk., 1894.
[4] Deut. med. Woch., 1895, No. 21.
[5] Jour. Akush. i Jensk. Bol., 1895, p. 846.
[6] Monatsschr. f. Geburtsh. u. Gynäk., 1897.
[7] Berlin. klin. Woch., 1898, No. 1.
[8] *Ibid.*, 1898.
[9] Wien. klin. Woch., 1898, No. 11.
[10] Vratch, 1900, p. 102.
[11] Am. Jour. of Obstet., Sept., 1900.

Pregnancy is characterized in the beginning by a marked increase in the waste products of the body and an increase in the production of leukomains. The toxicity of the urine is increased. The elimination furnished by the menstruation ceases, and the condition of pregnancy increases the work of the lungs and heart. There is an increased tendency to dyspepsia with intestinal fermentation. As long as the kidneys can do so, they dispose of the morbid products of the bowel and thus still further add to the toxicity of the urine. The function of these organs may be impaired by the overwhelming amount of toxic matter in the blood and prove inadequate to its elimination. This, in brief, is the theory of autointoxication that is steadily gaining ground. In reality there is a hepatic inadequacy rather than a renal. In the etiology of this condition a sedentary life, tight lacing, warm climate, and arthritism are predisposing causes. In the majority of cases eclampsia is preceded by dyspeptic symptoms, and Hanot claims that the incoercible vomiting of pregnancy is only an expression of a slow autointoxication of hepatic origin. Strumpf has found acetone in the urine of all eclamptic persons; the urine at the same time was found to be low in toxicity, while the blood-serum was two or three times more poisonous than the serum of health. An excess of waste products reaches the liver of a pregnant woman and there causes a degeneration of the hepatic cells with a retention of materials that quickly break up into toxins. Increased toxicity of the blood in pregnancy has been shown by Van der Velde, who showed that pregnant rabbits were much more sensitive to the action of human urine than nonpregnant animals. A lessened toxicity of the urine must mean increased toxicity of the blood. Given a free escape of the nitrogenous elements in the urine, the liability of eclampsia diminishes in direct proportion. The percentage of urea is an index of the amount of waste successfully excreted, and if this percentage is high there is probably not a great accumulation of poisons in the blood. It is evident that the albumin is not an index of the liability to eclampsia, but the daily amount of urine excreted and the relative proportion of solids contained in it. The abrupt cases of eclampsia usually show not a trace of albumin, but a diminished excretion of the urinary solids.

Bouffe de Saint-Blaise [1] states that, although he has seen 3 cases, the *absence of albuminuria is extremely rare.* Bar, however, thought that before and during the convulsions it was not very uncommon, for he had met with 7 examples of it in 70 cases of eclampsia, but in his cases there had always been albumin in the urine after the attack. Both agree that the absence of albuminuria is no safeguard against convulsions; indeed, they and Budin and Pinard express the conviction that puerperal eclampsia is not of renal origin, but only finds expression in such urinary phenomena as albuminuria, indicanuria, etc. Pinard goes so far as to declare that the word eclampsia ought to be given up, for the paroxysm is but a symptom, the disease itself being due to hepatic insufficiency, and the kidneys only secondarily affected. The hepatotoxemia, he says, cannot be detected clinically, but fortunately

[1] La Presse Méd., Aug. 22, 1900.

albuminuria is almost always present and is the signal for putting the patient on the use of a milk diet. Bar says that the forms of albumin found in the urine in eclampsia are peptones of variable composition, and he thinks they are the products of toxins circulating in the blood and are eliminated by the kidneys. After the paroxysm there supervenes a veritable urinary unloading of albumin, indican, etc., which shows that the blood is hypertoxic. In 2 of Saint-Blaise's 3 cases of eclampsia without albuminuria the patients were of "hepatic antecedents" and showed some general signs of poisoning, but no albumin in the urine at any time, although the urine contained biliary waste products in abundance. [Milk diet and the treatment proper for the hepatotoxemia of pregnancy should be instituted at the very first warning, especially in women who have previously shown signs of biliary trouble, for biliary derangement readily runs into hepatic insufficiency during pregnancy.]

Puerperal Eclampsia and Cerebral Hemorrhage.—Boissard[1] observed a case of this kind in which, though albuminuria was marked, the fits did not seem severe. Prognosis is ever uncertain in eclampsia; repeated fits and long periods of coma do not always end in death, and after delivery the obstetrician often thinks that recovery is certain if the slightest amelioration occurs within a few hours. In Boissard's case the patient had three fits, and seems to have been but slightly comatose. Delivery was effected speedily, and the coma began to pass off. Six hours after delivery two fits occurred. Venesection was performed, but 3 hours later the patient died. The rapidity of death after the fits suggested cerebral hemorrhage, and free hemorrhage was discovered on the surface of the convolutions of the left hemisphere. There were also very widely distributed hemorrhages in the liver, subscapular, interlobular, and intralobular. Bar, in discussing the case, declared that cerebral hemorrhages were common in eclampsia. Schwab recalled his case, in which temporary hemiplegia occurred. Maygrier spoke of his more recently reported case in which sudden and rapidly fatal asphyxia was caused by cerebral hemorrhage, which nearly destroyed the bulb and the floor of the fourth ventricle.

Treatment of Puerperal Eclampsia.—An editorial[2] remarks that the great value of saline enemas in a number of conditions, of which the most important are severe hemorrhage, uremia, and puerperal convulsions, is not sufficiently appreciated. One reason for this appears to be that intravenous or subcutaneous saline injections are much more recommended by authorities. Why then neglect to enforce the value of the much simpler, far more generally available, and equally efficacious method of rectal injection we cannot imagine, unless it be that its very simplicity has caused them to overlook it. In the emergencies of general practice instruments for intravenous or subcutaneous injection will often be wanting and can be procured only after a loss of valuable time. In these conditions the all-important indication is to reestablish the renal secretion, and not, as is often thought, to endeavor to stop the con-

[1] Bull. de la Soc. d'Obstét. de Paris, Feb. 15, 1900. [2] Lancet, Mar. 9, 1901.

vulsions by chloroform, bromids, morphin, etc. [That these measures are of some value is not denied.] The introduction of saline solution into the circulation is the most trustworthy of all methods of reestablishing the renal secretion, and the simplest means of accomplishing this is by saline enemas. In addition, barley-water or other diluents may be given by the mouth—as drinks if the patients can swallow, by the stomach-pump if they cannot. [If this rational treatment, which aims at removing the cause of the uremia or eclampsia, were generally adopted, instead of the mere treatment of symptoms by sedatives, we believe that many valuable lives would be saved.] Porak uses 30 to 50 liters of tepid 7 per 1000 salt-solution under weak pressure. When the irrigation brings a discharge of pure bile, he desists. Jardine [1] reports a series of 22 cases of *eclampsia treated by diuretic infusions.* He says that in the actual seizures of eclampsia diuretics by the mouth are too slow in action, and that for the past 3 years he has been giving saline infusions consisting of sodium chlorid and potassium bicarbonate or sodium acetate. The infusions are given usually under the breast. In his first 12 cases he used potassium bicarbonate and sodium chlorid in equal parts, a dram to the pint. In the last 10 cases he has substituted sodium acetate for the potassium bicarbonate, using 1 dram of it with 1 dram of sodium chlorid to the pint of sterilized water at a temperature of 104° F. One to 3 pints may be used at a time and repeated if necessary. Aseptic precautions are rigidly followed, but the author has never had any sloughing or abscess-formation in 200 infusions. He feels confident of the diuretic action of the infusion, as in some of his cases from 60 to over 100 ounces of urine was measured in the first 24 hours. In several cases analysis of the urine both before and after infusion gave a marked increase in urea and uric acid after infusion. In addition he gives chloroform, veratrum viride, chloral and bromid, and magnesium sulphate. The obstetric treatment is varied according to the condition of the patient. If there is no indication of labor he does not empty the uterus unless the convulsions continue, and then if dilatation is difficult, the cervix is freely incised. Cesarean section he thinks unjustifiable in these cases, as the results have been anything but good. Of the 22 cases treated by diuretic infusions, most of which were very severe, all but 5 of the patients recovered, and 1 of these 5 died on the seventh day of perforating duodenal ulcer. This case being properly omitted, we have a mortality of only 4 in 22 cases, which is noteworthy in a series of hospital cases.

Cesarean Section as a Prophylactic in Eclampsia.—Hubert [2] attempts to revive the above resource, although Cesarean section is now unanimously regarded as contraindicated in eclampsia. He gives no new arguments and apparently has no following save some of his students at the University of Louvain. He apparently has had one or perhaps several successful cases, but these are counterbalanced by a great number of failures at the hands of the profession in general. He has no guarantee that to empty the uterus will forthwith put a stop to the

[1] Brit. Med. Jour., May 26, 1900. [2] Jour. d'Accouchements, June 17, 1900.

eclamptic seizures, and in many cases the interference has resulted otherwise. In at least one-third of ordinary cases of eclampsia the convulsions are prolonged beyond the period of delivery. But when can we say—regarding the interference as purely prophylactic in aim—that eclampsia is about to set in? We may often fear it, but that is very different from actually foreseeing it. Precursory signs do not always foretell, while in certain cases all premonitory evidence is absent. Hubert indulges in sophistries like the following: The mortality of eclampsia is 50%, that of Cesarean section but 15%; why not turn our case of eclampsia into one of plain Cesarean section and give our patient a greatly improved chance of survival? To offset this it is only necessary to quote Döderlein's figures, from which it appears that the mortality of the Cesarean operation in eclamptics is 42%, which is probably not less than the actual mortality of eclampsia in general.

Contracted Pelvis.—S. Marx[1] remarks that the term pelvic contraction is only a relative condition, and in but very few cases does the bony pelvis afford an absolute indication, and that in cases only when neither a living nor a dead child can be delivered by the natural passages. We do not measure a pelvis by inches, centimeters, or millimeters. We estimate its size and test its capacity for the reception of the head which must pass through it. Small and even fair-sized fetuses have been delivered through pelves whose diameters were far from normal and in which the possibility of major forms of operating were to be anticipated; and in some major operative interference had already been in active process. Women with apparently normal pelves in labors with large children very frequently give us the picture of a pelvis relatively contracted, and as such would warrant operations of a more difficult type than those in whom the pelvis shows a diminution in all its diameters. He advises against the election of any form of operating months before, since the fetal head must always remain the sole doubtful element. When once we fail to get the head to engage, it is proof positive that the pelvis is too small for the head, or the head too large, and when this condition obtains, the time to interfere is at hand. He advocates the systematic use of the pelvimeter for purposes of comparison only, and deprecates the absolute value of the instrument as one of precision, and never pins his faith as to results which it gives in determining when or when not to induce labor when there is disproportion between the maternal pelvis and the fetal head. According to C. Jewett,[2] the opinion seems to be that **pelvic contraction is very rare in this country.** He believes, however, that the frequency of this anomaly does not differ materially from that in the old world. It is present in from 10% to 15% of all parturients. He remarks that there is urgent need of more systematic pelvimetry in our hospitals and general practice. Among the more useful indications of pelvic contraction at labor are the following: (1) Failure of the head to engage during active labor. (2) Failure to engage the head by well-directed suprapubic pressure. This is a diagnostic point which may often be employed to advantage in the few

[1] Med. News, No. 26, 1900. [2] Canad. Pract. and Rev., Feb., 1901.

weeks immediately preceding labor. (3) Failure of tentative traction with forceps. In partial engagement of the head, the latter should always be tried with the aid of the Walcher posture before resort to cutting operations. The methods of delivery in pelvic contractions are: (1) Spontaneous delivery; (2) craniotomy; (3) the induction of premature labor; (4) symphysiotomy; (5) Cesarean section. He states that spontaneous delivery occurred in 60.7% of the cases in his service. Such figures serve to emphasize the importance of withholding intervention so long as there is a reasonable doubt that the labor may be terminated safely by natural forces. With efficient pains, apparently impassable obstruction sometimes may be overcome by extreme molding of the head. Craniotomy had not been practised on the living child in his service, though he believed in rare instances the sacrificial operation is better than its alternatives. In extreme exhaustion of the mother the interests of the child should not have too much weight. This is particularly true in private practice. Induction of premature labor had not been performed owing to the cases having come under observation in the last weeks of pregnancy. When the period for such an operation is very limited, the interests of the child are to be considered. To offer a fair chance of success the time must be about the thirty-fifth week and the conjugata vera not below 3¼ inches, or at the lowest 3 inches. At best the fetal mortality is high from prematurity after birth, being reported at from 20% to 38%. [Yet Tarnier, commenting on his own results in 116 cases of induced labor, in which none of the mothers died and 26 children were lost, pertinently observes that it is better to save 100 mothers in 100 labors, with a loss of 20 infants, than to lose 8% of the women and 10% of the children by Cesarean section.] Symphysiotomy has not replaced Cesarean section in relative contraction, and experience has restricted its scope within narrower limits since its recent general revival. The gain in the conjugate cannot exceed a half-inch consistently with the safety of the sacroiliac joints. The operation compares unfavorably with Cesarean section in that it does not effect delivery, but merely prepares the way for it. Finally, the after-care is complicated and difficult. Jewett believes the injuries to the soft parts and imperfect union are preventable. He disagrees with those who think the operation has not justified its existence. It offers a fair chance in the presence of considerable exhaustion, a condition in which Cesarean section is attended with very high mortality. It is also applicable in minor cases of narrowing too slight to justify section primarily, yet in which nature and forceps have failed. In cases in which very little additional space is required for delivery it offers a means of saving the child, which is less formidable than abdominal section. The opinion that the pelvis remains permanently larger after symphysiotomy appears to have no foundation in fact. The best results in Cesarean section have been those of elective operations. The advantage of operating before the exhaustion of labor, and at a prearranged time, is apparent. Yet, **operation in advance of labor** is not universally accepted. Against it is urged the risk of hemorrhage from failure of

uterine contraction. There is no proof that the complication is due to antepartal deliveries, because atony is sometimes encountered after spontaneous deliveries. A much-discussed question is what to do with the uterus. The chief cause of mortality in the conservative operation is infection, springing from the uterine cavity. In certain conditions the necessity of hysterectomy admits of no question. All are agreed that the uterus must be removed in the event of probable infection; *e. g.*, gonorrhea, acute and chronic. In such cases failure of union and leakage are likely to follow. Persistent atony of the uterus is also an indication for the removal. The comparative results of hysterectomy and Cesarean section are not yet determined. Theoretically the radical operation should be better. The ethical question must of course be considered. Except when demanded in the interest of her life, the surgeon cannot assume the right to sterilize the woman without her consent. Hermann [1] exhibited a child with a marked funnel-shaped impression upon the vertex acquired in connection with the operation of turning and extracting in a case of contracted pelvis. [An inspection of the literature of the subject shows that these impressions are of very infrequent occurrence. Ahlfield has seen but 10 cases in 3000 labors. The prognosis is better than in other forms of injury to the cranial bones, fissures, fractures, etc. Remote effects involving the development of the encephalon are unknown. This lesion is typical of the result of extracting the aftercoming head in contracted pelvis. A short, violent effort of traction is a requisite for its production. Such an experience can be eminently dangerous for a child, and the favorable issue of the author's case should not make us oblivious of the usual prognosis in such instances (mortality in version in contracted pelves 36 %).]

The Danger to the Child's Life in Precipitate Labor.—An editorial [2] remarks that precipitate labors are uncommon, and yet quite a large number of cases can be collected from current medical literature. The fact that in such cases the mother is often taken completely by surprise might lead to the idea that the danger to the child's life would be great. Such, however, does not appear to be the case. When the death of the child occurs from the rapidity and suddenness of the labor, it must be due as a rule to one of two causes: Either to the child being suffocated by falling into a closet at the time of delivery, or to the injury which the child receives from falling in cases in which the woman happens to be delivered while standing. The first of these accidents has undoubtedly occurred from time to time. With a view to determining the effects upon the head of a child falling from different heights, the following experiments were carried out by Licieux: Fifteen stillborn children were allowed to drop perpendicularly from a height of 15 inches on to a hard floor; in 12 of them a fracture of one or both of the parietal bones was found. In the same way another 15 stillborn infants were allowed to drop from a height of 3 feet, and in 12 instances fractures of the parietal bones, in some cases extending to the frontal bones, were found. From these experiments it might well be supposed that

[1] Allg. med. Central-Zeitung, Feb. 17, 1900. [2] Lancet, Aug. 25, 1900.

children born while the mother was standing would almost certainly be fatally injured. The actual facts do not, however, bear out any such supposition. Klein, of Stuttgart, collected 183 cases of sudden expulsion of the fetus. Of these, 155 children were expelled while the mother was in the upright posture, 22 when sitting, and 6 when on the knees. Twenty-one cases occurred in primiparas. Of the whole number no single child died, and no example of fracture of the bones or any severe injury occurred. Two of the infants suffered temporary unconsciousness, and one had a scalp-wound with some bruising over the right parietal bone. An interesting legal case in which this question was involved is reported by Lee. An unmarried girl was indicted for murdering her illegitimate child. There were no marks of external violence, but blood was found in considerable quantity under the scalp over the frontal bones. The pericranium was separated from the bones and both parietal bones were fractured, the left in three places, the right in one place. Portions of the lungs floated in water. For the prosecution it was argued that the child was born alive and was killed by intentional violence applied to the head. For the defense it was contended that the prisoner had been taken suddenly in labor while in a standing position in the yard, and that the injury to the head was caused by the child falling upon the ground, which was frozen and hard. The jury brought in a verdict of acquittal. There are several possible reasons why the sudden and unexpected occurrence of labor is so seldom attended with any injury to the child. It is probable that the majority of women under such circumstances instinctively assume as far as possible a somewhat squatting position, and so the actual distance that the child falls is not great. The cord no doubt acts as a restraining force and breaks the fall, and even if it be completely torn through, the descent of the child will be checked sufficiently to prevent serious injury. The occurrence of hemorrhage from the torn cord is a possible danger. That a child may die from the accidental or intentional failure to tie the cord has been proved by several fatal cases. In 21 of Klein's 183 cases of sudden labor the cord was torn through close to the abdomen and yet in no single case was there any fatal hemorrhage. The condition of the cord torn through by the sudden and forcible expulsion of the fetus may well be compared to that of the cord of animals, in which the mother is accustomed to gnaw it through. In both instances the vessels would be more likely to contract and retract than when cleanly cut, and the tendency to the occurrence of hemorrhage would be very slight. An examination of the recorded cases, therefore, does not tend to confirm the common opinion that the danger to the child in a case of precipitate labor is considerable.

Superficial Emphysema Occurring During Labor.—J. Barr Stevens [1] describes an example of that rare complication of labor, superficial emphysema. He attended a young woman aged 20, in her first confinement. She had always enjoyed good health, and was at full time. As the head approached the perineum, the pains being very

[1] Glasgow Med. Jour., Aug., 1900.

strong, Stevens twice heard "a small clicking sound resembling that produced by squeezing in a part of a felt hat and allowing it to spring out again." The nurse observed that the patient's face was swollen. Both eyes were almost closed by extensive swelling, which was recognizable as surgical emphysema by crepitation and pitting on pressure. This equally involved both sides of the face and neck, together with the upper part of the chest, reaching down behind as far as the top of the crests of the scapulas, and in front slightly affecting the breasts, while it also extended down the right arm for a short distance. At this stage labor was wisely ended by the application of the forceps. The emphysema rapidly and completely disappeared. Slight traces of it remained on the fifth day, but were gone on the seventh. There was never any sign of pneumothorax, nor was there any spitting of blood, but there was slight pain on swallowing for 4 days. Stevens favors the view that in such cases the air enters the interstitial lung-tissue by rupture of the air-vesicles, and passing along the connective tissues, reaches the root of the lung, up along the trachea, and so into the subcutaneous tissues. [A number of recorded cases are mentioned, and the experiments of Champneys upon fetuses are also referred to in support of this view. According to Champneys, the condition occurs once in about 2000 labors. Klots has collected 40 cases, 1 of which was fatal. In 8 cases the subjects were unhealthy (5 delicate, 1 pleurisy, 1 hemoptysis, 1 eclampsia); 12 were mentioned as strong, and the remainder healthy. It is therefore concluded that no predisposing cause is necessary to the occurrence of emphysema in labor, the one essential being abnormal strength of pains, excited by abnormal opposition; *e. g.*, (1) large child, (2) small pelvis, (3) rigidity of the soft parts. It is probable that in many cases emphysema is overlooked, while it is doubtless observed without publication in frequent instances; so that it may be regarded as by no means so rare a complication as a perusal of the literature would suggest.]

Rupture of the Uterus.—Wendel[1] states that the most essential factor disposing to rupture is overretraction of the upper segment of the uterus with consequent excessive, and therefore dangerous, thinning of the lower segment and cervix. The most frequent cause of the condition is pelvic obstruction, the milder forms of contraction predominating. There are various contributing causes, such as obesity, external violence, sacculation, retroflexed uteri, and congenital displacement of abdominal viscera. Very trivial causes are sometimes encountered; *e. g.*, rupture during sleep and cases following simple primary uterine inertia. The milder forms of pelvic contraction should be noted early in labor. The severer forms of contraction are detected early and readily, but the diagnosis of milder cases of general contraction can be made only by careful external and internal pelvimetry. Wendel states that if in spite of strong uterine contractions the head fails to descend, and frequent examinations of the abdomen prove that the upper segment continues to retract, as shown by the ring of Bandl and tension of the

[1] Med. Rec., May 26, 1900.

round ligaments during contraction (particularly if the Bandl ring becomes oblique, one or both poles near the navel, and one or both round ligaments remaining tense between pains), rupture may be expected if delivery is not speedily accomplished. Prompt and deep chloroform-narcosis should be employed to stop the contractions and retard further thinning. In mild cases, the head presenting, forceps may be applied with greatest gentleness, but only by a skilful accoucheur. There is no dividing line that can be determined between threatened and beginning rupture. Is it justifiable then to use forceps in high degrees of thinning? Koblank found that 10 of 80 cases of rupture were caused by forceps. Winckel and Schaeffer found that high forceps give worse results to mothers. Two distinct rules are applicable to head-presentations when rupture threatens: (1) When thinning of the lower segment is slight and the round ligaments are tense only during contractions, deliver with forceps. (2) When Bandl's ring is very high or very oblique, and one or both of the round ligaments are tense between pains, delivery should be effected by Cesarean section or craniotomy. The same rule holds good for version in head-presentations, the hand being substituted for forceps. The rule of action in transverse presentations is simpler, for when the child is living this fact indicates that dangerous thinning has not yet occurred and version may be attempted with deep narcosis. When rupture has occurred, delivery must be accomplished without increasing the injury. In head-presentations with living fetus *in utero* the prompt application of forceps may save the child without increasing the mother's danger, provided that the os is completely dilated and no pelvic contraction exists. When the head remains in the uterus and the body has escaped, McLean argues that the danger of increasing the injury no longer exists, and recommends passing the hand along the child until a limb can be grasped, then rotate and deliver, instead of losing time by attempting to grasp the mobile head with forceps. A dead fetus would of course be delivered by perforation and cranioclasty. Spontaneous rupture with transverse presentation results almost invariably in fetal death. Embryotomy would therefore take precedence when the fetus remained either entirely or in greater part in the uterus. If rupture occurs during version the operator must judge whether he would better continue or not; in general the child should have a chance for life. When the child escapes entirely into the peritoneal cavity, the conjugate diameter measuring less than 8 centimeters, abdominal section will be necessary. Weiss and Schul [1] lay stress on the gravity of the abdominal lesions revealed on operation, and this they say constitutes an argument for opening the abdomen in cases of uterine rupture. Some authors lately had recommended methods of uterine drainage and packing, and antiseptic injections into the uterus. Merz has collected 181 cases of complete rupture, and of these at least 117 were not treated by laparotomy, and 37 of these recovered. In 42 of the cases drainage of the rent and uterine tampons were the treatment employed, and 24 of these recovered. Vaginal hysterectomy also comes

[1] Ann. de Gynéc. et d'Obstét., Apr., 1900.

into competition with laparotomy in such cases and has given good results. The advantages of abdominal section are that the full extent of the mischief can be accurately determined and all vessels ligatured and all rents repaired. Total hysterectomy can be performed in the worst torn cases, and supravaginal amputation with extraperitoneal pedicle can be employed to shorten the operation if desired; also, the peritoneum can be cleared of clots, etc. If the child has escaped into the abdominal cavity this is the only thing to do. The objection to this plan is the great shock it causes in a patient who has already undergone the very severe shock of uterine rupture. The advantages of vaginal hysterectomy are the relative ease of the operation after labor, and the perfect drainage obtained, together with the adequate control of the hemorrhage. The authors are in favor of abdominal intervention in almost all cases.

FETAL DYSTOCIA.

Origin of Frontal Positions.—Glitsch [1] states that the usual view of the rationale of this position is that it is a transition between the occipital and facial position. There must, however, be some special mechanism at the bottom of persistent frontal positions. The author, who is Walcher's assistant, has recently made a study of a case in point. The patient had been under the care of a midwife, who had called in medical aid after the woman had been long in labor. She was found to have a very pendulous abdomen; the uterus was markedly tense, as is usually the case in obstructed labor, being in a tetanoid state. The os was well dilated. The forehead of the child could be made out behind a serosanguineous boss. The pelvis was moderately flattened and narrow. Walcher carefully examined the case and found that the head was movable in the pelvis. The hand could be pushed up past the head and along the anterior wall of the uterus. A retraction-ring could be felt opposite the neck of the child, and at this point the uterus was bent forward at an acute angle, so that there was a deep kink in its anterior wall. The uterus was held in this position by the muscular contractions of the much shortened round ligaments. **At each pain the head ascended into the pelvis.** Turning seemed an impossibility under the circumstances, and an attempt was made to correct the position of the head by manipulation. An attempt to bring about an occipital position met with success, and the forceps was then applied. The head being very large, and the pelvis narrow, extraction was accomplished only by great efforts, the woman being placed in the Trendelenburg position, and the uterus pressed upward and backward by assistants. Both lips of the cervix were clamped within the forceps and drawn out as far as the vulva, on account of the inability of the head to emerge from the os. The lips were torn through in liberating the head. The case terminated fortunately for both mother and child. [It is evident that to produce a face-position two factors are necessary: First, deep location of the sinciput for any reason, but most commonly a flat pelvis; and second, force

[1] Monatssch. f. Geburtsh. u. Gynäk., Aug., 1900.

from above which changes an initial low location of the sinciput by slight degrees into the face presentation.] In the present case the anteflexion of the uterus was undoubtedly a factor in the abnormal presentation. Whether the anteflexion was due to the pendulous abdomen or the shortened round ligament cannot be told. The retraction-ring apparently determined the point at which the bend in the uterus occurred. The part of the uterus above the ring was able to contract entirely and supply the expulsive force for a normally seated uterus, but in the presence of such a flexion the force was retroactive and tended to send the head back instead of forward. We must now ask why in this case a frontal presentation came about instead of a facial. Why was the natural process of conversion arrested? The most plausible view is that the arrest was due to contraction of the internal os. With regard to the cause of the shortening of the round ligaments this cannot be determined with certainty. In the present case there was evidently a vicious circle; the anteflexed uterus prevented the round ligament from lengthening during pregnancy, and, once shortened, the ligaments refused to permit the fundus to ascend. With these several anatomic peculiarities some abnormality of position would seem inevitable. In this case there were several indications: (1) Correct the pathologic kinking of the uterus. (2) Correct the position of the head. (3) With regard to the narrow pelvis, supply external force with the forceps. These indications were all filled in the present case. [Whenever we have a frontal presentation we should especially determine as to the presence or absence of back pressure, causing the head to ascend during a pain. We may hereby throw some light upon the genesis of frontal presentations, and determine whether the theories of Schatz and Walcher are likely to hold good.]

The Treatment of Persistent Occipitoposterior Positions of the Vertex.—Brodhead [1] advises the use of forceps as rotators in persistent posterior rotation of the vertex during labor. The conditions which should be present before this operation is undertaken are as follows: The head should be as well flexed as possible; the vertex should be well down in the pelvis and preferably at the vulvar outlet; the membranes must be ruptured; the cervix should be fully dilated or dilatable; the bladder and rectum should be empty; last, but not least, the operator should be positive of his diagnosis of position. The patient is placed upon a table and a light chloroform-anesthesia used. The Tucker solid-bladed forceps has been superior to any other in his hands. The blades are introduced laterally at the sides of the pelvis, each blade being rotated so as to occupy a position at the side of the head, after which the forceps is locked. Unless the operator be expert it is thought safer to apply the forceps in the usual manner, the concavity of the pelvic curve looking forward, than to attempt rotation with the forceps in the inverted position. By carrying the handles of the instrument toward the thigh of the patient, toward which the concavity of the pelvic floor looks, the danger of laceration is much reduced.

[1] Am. Jour. of Obstet., Dec., 1900.

The operator then places two fingers upon the vertex at the sagittal suture, and when the uterus contracts it rotates the head partially, so that the sagittal suture is transverse. This is accomplished by rotating the handles of the forceps and carrying them downward and backward until the concavity of the pelvic curve faces the lateral wall of the pelvis. The head is then held in this transverse position until several uterine contractions and relaxations have occurred. The head is then rotated with the vertex anterior by rotating the handles, carrying them still further backward and downward. In this way the tips of the blades are kept in the middle of the pelvis, and cannot lacerate the vagina. The head is held in the oblique anterior position for several moments to allow the body to rotate anteriorly. The forceps is usually removed at this time and reapplied in the usual manner and the operation completed. If rotation cannot be accomplished except by the use of force the head must be extracted in the posterior position. If delivery can be accomplished by the natural forces the forceps is removed. The writer reports 8 cases, in 4 of which the vertex was upon the left side and posterior and in 4 on the right side and posterior. Seven of these women had normal pelves. One, a primigravida, had a justominor pelvis. The operation was uniformly successful in these cases. The writer urges that the conditions essential are good flexion of the head, low position of the vertex, and attention to details.

OBSTETRIC OPERATIONS.

The Induction of Labor.—Von Braitenberg [1] has reported 22 cases of this form of intervention with great thoroughness, his material being carefully tabulated. He states that in this connection the saving of the maternal life has received the most complete consideration, and that the propriety of such intervention for such a purpose is fully admitted on all sides. But there is another aspect to the question,—namely, the survival of the child,—the performance of this operation for the ostensible purpose of saving the life of the child as well as that of the mother. It is upon this point that authorities differ, and here we find the necessity for further research. In 1891 Kehrer went over the statistical material and found it to be 14.2 %. Much of this material was from the preantiseptic period. To-day the maternal mortality has been reduced to about 2 %. Sänger fixes the mortality to mothers in the conservative Cesarean operations as 8 % to 10 %, while for symphysiotomy Grusden finds the fatalities amount to 11 %. Turning now to infantile mortality, this is confessedly high in premature delivery; but we must not forget that Skorscheban, who traced the fate of many children extracted by Cesarean section, found an equally gloomy state of affairs. We must also remember that children mature and healthy at birth are often allowed to perish through neglect by some one. From July, 1887, to date, 7472 confinements occurred at the Innsbruck clinic. As there were but 22 cases of artificial premature delivery during this period, the

[1] Wien. klin. Woch., July 26, 1900.

frequency of the intervention was but 0.29 %. In 8 of these cases the particular end in view was the salvation of the maternal life. One of these patients died 7 days after intervention from septic peritonitis, and in 5 of the 8 cases the puerperium was febrile. In the other 14 cases the particular end proposed by the intervention was to save the life of the child. In all but one of these cases the threat to the child's life came from deformity of the pelvis. The other case was one of habitual death of the fetus. These 14 women had borne collectively 16 children before the present intervention. Of this number 14 were lost (87.5 %). As a result of the premature delivery the children in 8 of the 14 labors were born alive (43 %). The chance of infantile survival is therefore seen to be much improved. The 14 mothers all survived and in only 3 cases was the puerperium febrile. With regard to the value of the various methods employed,—puncture of membranes, bougies, vaginal and uterine colpeurysis,—many different opinions prevail. In recent times new methods have been discovered and old ones revived. In the author's experience Krause's method of introducing bougies appears to be the best for intervention in irregularly narrow pelves; while simple puncture of the membranes is preferable when the pelvis is normal, or in uniformly narrow pelves. As a precaution in puncture, however, there must be no likelihood of prolapse of the cord. Puncture is also advocated under any circumstances when the indication is to save the life of the mother. In case Krause's method and puncture do not lead to satisfactory results, von Braitenberg advocates intrauterine colpeurysis. Minor measures, at times sufficient of themselves to induce labor, are recommended as adjuvants. These include full baths, sitz baths, vaginal douching, vaginal tamponade, glycerin-iodoform gauze tamponade of cervix. [We do not indorse the method of puncture if it can be avoided.] Heymann [1] remarks that in disproportion between the child and mother, the best time for the induction of labor is from the thirty-third to the thirty-fifth week, when its results are better than those of any other method of delivery for both mother and child. Among children so born, 64.3 % survive in good condition. Cesarean section gives a better result for the children, but at a much greater risk to the mother. Care must be taken that the induction of labor be not practised when the pelvis is too small. An internal conjugate of 7 centimeters (2¾ inches) is the lowest measurement at which the induction of labor can be expected to be successful. Before the thirty-fifth week of gestation the chance of survival for the child is not good, while after the thirty-fifth week, if the child has good care, its chance is as good as at full term. The induction of labor gives brilliant result in cases in which the pregnant woman is attacked by some disease which threatens to end her life. Its field may be extended also to those conditions which cause the mother great suffering during pregnancy, and render the continuance of the pregnancy a serious matter; for example, when the mother's respiration is greatly interfered with by polyhydramnios and the presence of twins, and when severe abdominal pains occur. These latter cases

[1] Am. Jour. Med. Sci., July, 1900.

often result from endometritis. In those cases complicated by hemorrhage the induction of labor is also indicated. In fevers occurring during pregnancy it may be necessary to end the pregnancy, and thus remove the serious complication. In retroversion and retroflexion uteri which cannot be replaced, in molar pregnancy, and in pernicious nausea and vomiting, the induction of labor is often of the greatest value. Under favorable conditions eclampsia during pregnancy should be treated by the induction of labor, but the cases must be carefully selected. The writer lays especial stress upon the positive indication for induced labor found in nephritis, valvular heart lesions, and tuberculous infection. In the presence of these conditions pregnancy, in his opinion, should be terminated. He would interfere early rather than late in these cases.

Boss [1] bases his paper on **colpeurysis and metreurysis** upon a study of 28 cases of the use of dilating bags in obstetric practice. Braun's colpeurynter was used in preference to Champetier de Ribes' balloon. While the latter is much better in theory and also in practice when a good specimen is obtainable, the apparatus in possession of the writer was defective, and it was thought best to use Braun's instrument. In practising these dilating operations the patient should be placed transversely on the bed, the external genitals disinfected with hot water, soap, and jute, and with a solution of lysol, which latter is also thrown into the vagina. The colpeurynter is introduced with great care, bearing in mind the danger of air-embolism. It is folded into the shape of a cyst and applied within the vagina by forceps while the perineum is held back by two fingers. The bag is carried deeply into the posterior fornix of the vagina. The forceps is taken off while the apparatus is retained *in situ* by two fingers in the vagina. A syringe then slowly forces the water into the colpeurynter to adapt it closely to the vaginal wall. For this purpose 500 to 750 cc. of fluid is necessary, the smaller quantity sufficing for primiparas. The water is introduced by a syringe which holds but 100 cc., and after each injection the hose is clamped while the syringe is being recharged and also after all the water is in. The clamp then has a weight attached so as to be subject to a gentle traction (about a pound). With this apparatus in position pains usually set in or return if they have been suspended, usually at once, but exceptionally not until several hours have elapsed. The patients usually complain of the discomforts of the apparatus, and even try to remove it by bearing down, until finally it is expelled. This expulsion insures a thorough stretching of vagina and vulva. In metreurysis the preparation for the operation is the same as in colpeurysis. Narcosis, however, is often of use here, especially when the uterus is high up, or in the case of unruly women, and especially when the cervical canal is seen to be difficult to manage. Champetier's bag is far superior to Braun's apparatus as a metreurynter, and only in the absence of a good specimen of the former should we resort to the latter. In general, when these bags are used the bladder and rectum should be emptied. The manner of filling the

[1] Centralbl. f. Gynäk., July 28, 1900.

balloon is of great importance in metreurysis. If the bag is filled at once to the limit, smart labor pains rapidly supervene, and dilation may be so rapid that the cervix may lacerate. It is far otherwise when time is given for gradual obliteration. A small amount of fluid should first be introduced. With each pain the incompressible liquid flows downward, to ascend again in the pauses. Used in this manner the metreurynter acts physiologically, like the bag of waters. When the apparatus is in position, the maximum delay in the pains should not exceed 3 hours, while the bag should be expelled in 12 hours at most.

Forceps.—H. Gibbons, Jr.,[1] in writing upon accidents in the use of the obstetric forceps, bases his experience on 1200 obstetric cases in private practice, and 150 in consultation. In 190 of these cases forceps had been used. With ordinary care, he thinks serious injury to the mother from the forceps used is not likely to occur. He has never known a death to take place, or anything more than laceration of the soft parts. In these days of aseptic methods death should not occur, but the injury to the soft parts may leave important disabilities. Extensive lacerations of the perineum are more likely to occur in occipitoposterior positions, when rotation anteriorly has failed to take place. Lacerations of the neck of the uterus not infrequently occur from the use of the instrument by attempting to extract the head before full dilation of the cervix takes place; and if the patient's strength is good, and there are no other contraindications, the forceps should never be applied until dilation is complete. He calls attention to the liability of bruising the tissues covering the inner surface of the pubic arch by the jamming of the head and forceps against it. This occurs when the head is still in the oblique diameter, and pretty well up, so that the handles of the ordinary forceps cannot be depressed sufficiently to insure traction in the direction of the axis; and in these cases axis-traction forceps should be used, preferably those of Tarnier.

The danger to the child is far more serious than to the mother. Aside from minor injuries, which are not infrequent, but are usually of little importance, fracture of the bones of the head, rupture of vessels in the brain, or lacerations of the brain itself may occur. The **conditions of election for the forceps** are complete dilation of the cervix, sufficient time for molding the head that it may more easily pass through the pelvis, completion of the long rotation in occiput or chin posterior positions, and rotation of the head into the conjugate diameter of the pelvis. When these conspire, the forceps, in competent hands, has almost no danger to the child, and the danger should not be much, even with the tyro, if he has some experience in the use of tools and is a man of good judgment. But as we recede from these conditions the risk to the child becomes greater. When the head is still in the oblique diameter and not high up, the risk is not greatly increased, provided the instruments are applied to the sides of the head and in its occipitomental diameter with the occiput to the heel of the blades. The difficulties of application have, however, increased, and not even an expert can always

[1] Jour. Am. Med. Assoc., Nov. 17, 1900.

get them in exact position. If not exactly applied they grasp the head more or less obliquely, and if much force is required to effect delivery any of the accidents named above may occur. He thinks there is no excuse for the accidents which occur from the forceps slipping. Such an accident has never occurred in his practice. If the index finger of the hand that clasps the lock be extended to touch the presenting part the operator at once appreciates when slipping begins and can avoid it. All the risks to the child are increased the higher the head is in the pelvis, with the added danger resulting from the impossibility, with the ordinary forceps, of making traction in the direction of the axis of that part of the pelvis in which the head rests, and of being required to apply extra force, since much is lost by the necessary dragging of the head against the pubic arch instead of under it. The Tarnier forceps is far better suited to such cases. When the head is at the brim, the dangers are supreme. None but an axis-traction forceps should be used in such cases. Gibbons urges more conservatism in the use of instruments in labor, bearing in mind the fact that the duration of normal labor in primiparas averages 24 hours, and often extends into the second or even the third day without serious inconvenience or harm; and in the absence of those emergencies which imperatively call for the application of forceps the case should be left to nature.

The Choice of the Foot in Podalic Version.—[It is no new matter that the ease with which either the right or the left foot of the fetus can be seized and brought down is not the only thing to be thought of in making the choice. A more important point is the bearing of the selection on the chances of maintaining the dorsoanterior position or of securing an eventual rotation into that position.] D. Berry Hart[1] discusses this subject, in connection with the nomenclature of transverse presentations and of version, in a paper read at a meeting of the Edinburgh Obstetrical Society. He remarks that the terms applied to version relate either to the method by which it is to be performed, or to the fetal pole which it is intended to bring down; such terms as bipolar and external apply to the method, whereas podalic and cephalic apply to the aim. Hart cites Nagel as having given by far the most complete discussion of the question of which leg should be seized, considering it not merely from the point of view of the accomplishment of the version, but also from that of preserving the favorable position of the fetus or correcting an unfavorable one, thus taking the standpoint of Baudelocque, Hohl, and Gusserow. Hart sums up his own views in the following words: "Seize the knee or leg which maintains the dorsoanterior position or converts the dorsoposterior into a dorsoanterior—that is, take the farther limb in dorsoposterior cases, the nearer in dorsoanterior cases. When, however, in dorsoanterior cases the breech is in the fundus, traction on the nearer leg may convert it into a dorsoposterior, and when the breech is near the os in dorsoposterior position, traction on the farther leg may not alter the posterior position of the back after version, owing, again, to the want of the necessary obliquity

[1] Scottish M. and S. Jour., July, 1900.

in the pull." [It would be interesting to know in what percentage of dorsoposterior cases the position failed of correction after version by the method laid down by Hart, and also with what expectation of success means may be taken by either concurrent or subsequent manipulation to prevent such failure.]

Relative Indications for Cesarean Section and Symphysiotomy.—[Apparently this question is not fully settled in the minds of many obstetricians notwithstanding the valuable statistics on the subject that are now accessible.] Fischer [1] says that the precise distinction between the indications for these two forms of intervention are difficult to make. Each case must be a law to itself. In the author's opinion the relative indication for Cesarean section will gradually encroach upon the territory of symphysiotomy. In certain respects the advantages of one operation over the other are sufficiently apparent. Thus, Cesarean section must be chosen in the case of ankylosis of the sacroiliac joint, and also in an obliquely contracted pelvis; for, while literature contains accounts of symphysiotomy done under these conditions, the profession must award to Faraboeuf and Harris the credit of determining once for all the inexpediency of this operation under such circumstances. As a general principle, symphysiotomy is contraindicated in the primiparas; or if performed in this class of women, it must never be combined with extraction. It is Schauta who says that damage necessarily inflicted upon the soft parts of the primiparas by symphysiotomy and extraction is greater than that which results from forceps alone. Symphysiotomy is also contraindicated in transverse and breech presentation. When there is any likelihood of infection, or after unusually prolonged labors, Cesarean section is contraindicated. But is the outlook any better for symphysiotomy? Here authorities differ, the majority counseling perforation. It is often impossible to weigh the chances of Cesarean section against other methods until after the waters have broken, when some idea can be obtained as to the character of the pains and the possibility of spontaneous delivery. Another element in making a choice is the fetal head, its size and configuration. In other words, the first question to settle relates to the possibility of a spontaneous delivery; and when such a termination to labor appears to be out of the question, we must then determine as to what form of intervention must be practised. Löhlein and others claim that nothing can be determined as to the expediency of performing symphysiotomy until after rupture of the membranes.

Cesarean Section.—Dorland, in an editorial in the "Philadelphia Medical Journal," May 18, 1901, says that probably nothing better shows the remarkable immunity enjoyed by the peritoneum than the cases of self-performed Cesarean section that from time to time are reported in the current literature. Besides manifesting an astounding degree of stoicism, these patients seem to have the happy faculty of evading the disastrous consequences of their temerity, and that notwithstanding the most inauspicious circumstances under which the act is

[1] Der Frauenarzt, No. 5, 6, u. 8, 1900.

consummated. Filth to them is apparently innocuous, and bacilli have no terrors. A remarkable fact associated with these blood-curdling reports is that most, if not all, of the cases have occurred among the degraded classes of southern and eastern Europe, as in the last instance recorded by Löffler,[1] the victim being a Turkish peasant woman. Suffering from some obscure chronic affection, and fearing she would perish before the termination of her pregnancy, this stoical creature, at the eighth month of gestation, deliberately opened her abdomen and uterus with an ordinary penknife. As the child emerged, the woman fainted from shock and loss of blood. On regaining consciousness some time afterward the wound was sewed up at her request, by her daughter, aged 13, an ordinary needle and waxed-hemp thread being employed for the purpose. Notwithstanding these primitive measures, and the fact that a simple Cesarean section was performed, that is, without the insertion of uterine ligatures, the woman made an uninterrupted recovery. There were no manifestations of sepsis or peritonitis, and union of the abdominal incision was unattended with suppuration. The abdominal dressing employed was a layer of moss held in place by a filthy linen cloth. The child, which also survived, was nursed by its convalescent mother. Such cases seem to indicate the uselessness of the modern methods of antisepsis. If patients placed in the most unfavorable of circumstances can recover from the gravest of injuries without the development of any untoward symptoms, it would seem that the extreme care practised by the modern surgeon is altogether unnecessary and a waste of valuable time and material. Such cases naturally fall in line with those remarkable instances recorded of unbroken recovery following most extensive traumatism—accidental, military, and surgical. Many feet of bowel may be resected from one individual without ill-result, while a simple enterorrhaphy in another will be rapidly followed by a fatal termination; gravel, filth, and curious foreign bodies gain entrance into the peritoneal cavity and apparently excite not the slightest irritation, while a simple exploratory incision will be followed by grave or even fatal sepsis. The explanation of this curious phenomenon must be found in some refinement and extreme developmental sensitiveness of the tissues, whereby in one case there will be an apathy of the parts to external influence and in another a high degree of reaction. It is well known that individuals of higher mental and social development will react more promptly to these deleterious influences than will individuals much lower in the mental and social scale. In the autocesarean section above recorded, and in the others that have filled the curiosity-pages of surgery, this low position in the social scale was one of the attendant features in the cases. It was not because of the lack of surgical care that recovery followed, but in spite of the dangerous concomitants of the operation.

Postmortem Cesarean Section.—An editorial in the "British Medical Journal," July 21, 1900, asks, If a woman dies in a late stage of pregnancy, and if the unborn infant is not dead, should it not be

[1] Wien. med. Woch., No. 10, 1901.

saved if possible? Experience has shown that postmortem Cesarean section as a rule is unsuccessful, and it may naturally shock relatives who are not likely to demand or sanction a surgical procedure naturally repulsive, and believed on good grounds to be bootless. Yet a father may seek to save his infant, and the moribund mother may express the same desire. Taking sanction for granted, Cesarean section after death appears humane and reasonable. Failure must be the rule, for the malady which kills the parent usually kills the child, while the physiologic changes in the mother during death put it to absolute peril, which insures its own decease within a very short period. A rescued infant is likely, considering its antecedents, to be very feeble. Nevertheless, infant lives have been saved. Weinberg, of Stuttgart, operated on a woman so as to deliver the fetus within 5 minutes after her death from tuberculous meningitis. The moment after death the fetal heart-sounds were still audible. The child was saved, and according to the report it would seem that it was reared. Theoretically 1 % or 2 % of success would justify postmortem Cesarean section. In accidents the rescue of a single life amidst 100, or indeed, amidst an indefinite number, is better than the loss of all, including that unit. The only qualification is that many lives may under some conditions be risked in the rescue of one. In operative surgery indefinite risks are run at the will of patients and friends. In postmortem Cesarean section there is really no risk, but quite the reverse, as the death of the fetus within a very few minutes is certain, and the operation at least cannot kill it. [In every instance of this kind when there is no mechanical obstruction in the lower birth canal a rapid podalic version may be tried. On account of the relaxed condition of the parts this operation will be found to be easy of performance and unattended with the revolting features of an abdominal operation.]

Basilysis.—A. R. Simpson [1] points out that, in spite of the improvements in symphysiotomy and the Cesarean section, there is still a not inconsiderable field for embryotomy. In the year 1880 Simpson proposed the use of the basilyst for first perforating the cranial vault and afterward breaking up the base of the skull. To render the instrument available as an extractor as well as a perforator and comminutor, a traction-blade was added, which is applied outside the head like the external blade of a cranioclast. The reasoning upon which the basilyst was constructed was thoroughly sound. In the first place, comminutors, like the cephalotribe and the cranioclast, break up the base from without, if at all, while it is clear that a bony mass like the base of the skull can best be destroyed from within. The basilyst being a split screw, it can be used first to perforate the vault, and then can be screwed right into the base of the cranium. The halves of the screw are then forcibly separated, and the bones are effectively torn asunder. In the second place, considered as an extractor, the cranioclast, with one blade inside and the other outside of the skull, is acknowledged to be a better instrument than the cephalotribe, with both blades outside the skull. The

[1] Scottish M. and S. Jour., May, 1900.

basilyst, as used for extraction, is practically a cranioclast, for the split screw remains within the skull and acts like the inner blade of a

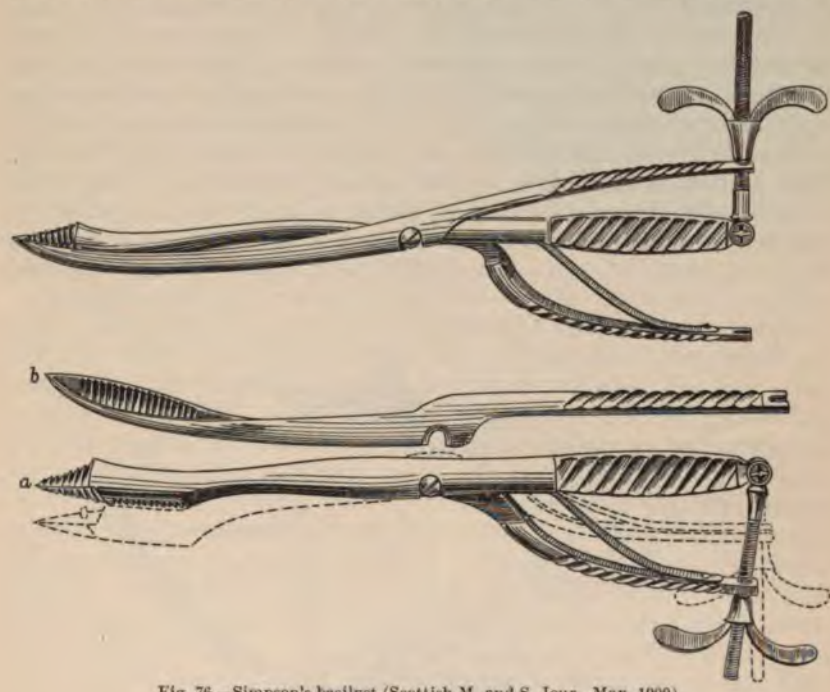

Fig. 76.—Simpson's basilyst (Scottish M. and S. Jour., May, 1900).

cranioclast, while the additional "traction" blade is applied outside. Simpson now considers that his earlier models were made too heavy, and he has therefore had the basilyst made lighter and more manageable. Figure 76 shows the construction of the improved instrument, which will doubtless become popular, as it is both a perforator and an extractor in one, and fulfils both purposes in the best manner possible. *a* is the split screw, for perforating and comminution. *b* is the outer blade, for application outside the skull. When the two parts of the instrument

Fig. 77.—Head of infant delivered with basilyst tractor after basilysis (Simpson, in Scottish M. and S. Jour., May, 1900).

are used together, the screw which was used for separating the halves of the perforator is swung over (see figure), to act on the handle of the traction-blade, and is used for approximating the inner and outer blades so as to grip the wall of the skull. Figure 77 shows the head of an infant after perforation, comminution of the base, and extraction with the basilyst; while figure 78 represents the head of another infant, delivered after basilysis without the aid of traction, hardened in formalin, and cut in the coronal direction from above downward. The base has been perforated in its anterior portion, and has been so fractured and softened that it measured only 1½ inches in width just in front of the ears. The mother of this infant was a girl aged 18, 4 feet 4 inches high, the subject of well-marked right dorsal and left lumbar scoliosis.

Fig. 78.—Section of head of infant delivered after basilysis (Simpson, in Scottish M. and S. Jour., May, 1900).

The pelvis was universally but unequally contracted, the conjugate being estimated at 3 inches, the lateral measurements being small, and the promontory being displaced to the right. Without entering into any discussion as to the relative indication in this particular case, Simpson points out how easily and safely it was managed by means of basilysis. The vault being perforated and the brain being washed out, the basilyst was screwed into the anterior part of the base, and the blades were then separated in various directions. After a few pains the uterus, aided by the pressure of an assistant's hands, through the abdominal wall, brought the head through the pelvis, and delivery was easily completed, the only injury to the mother being slight fissuring of the mucous membrane in the vaginal orifice at the base of the hymen.

PATHOLOGY OF THE PUERPERIUM.

Puerperal Sepsis. — *Etiology.* — Walthard [1] draws the following conclusions: (1) The diplostreptococcus is a pathogenic germ of the streptococcus group and not a saprophyte. (2) Like Streptococcus

[1] Monatssch. f. Geburtsh. u. Gynäk., Dec., 1900.

pyogenes, the diplostreptococcus is found with saprophytic characteristics on dead material, such as the vaginal secretion, the lochia, or the intestinal contents of healthy individuals. (3) The diplostreptococcus is found in pure culture as a producer of inflammation in the diseased tissues of the endometrium and the tubal mucosa, as well as in the exudates of endometritis, salpingitis, oophoritis, peritonitis, and pericarditis puerperalis. (4) The diplostreptococcus can reach the peritoneum through the endometrium and tubes and produce fatal suppurative inflammation without having entered either the blood or lymph-channels. (5) The fatal peritonitis caused by this organism differs from streptococcus peritonitis in its insidious and protracted course, finally ending in the classical picture of diffuse suppurative peritonitis.

Symptoms.—Berry Hart[1] distinguishes three forms of puerperal sepsis. The first is the acute and rapid form, in which a large amount of poison is directly absorbed, either through extensive lacerations or through the retention of placental or membranous tissue. In these cases the pulse may be high while the temperature is low, and the patient has the intoxicated appearance which indicates the gravity of the condition. The second form is the ordinary one in which the pulse and temperature rise within the first 5 days, with rigors and invasion of the peritoneum, pericardium, or endocardium. A large number of these cases recover with appropriate antiseptic treatment. The third variety, sometimes called the venous form, is that in which thrombi become infected and infected material is carried extensively through the circulation. Pyemia subsequently develops. In addition to these we see gonorrheal cases and puerperal tetanus, caused by the tetanus bacillus. He urges that these cases be reported to the authorities, just as scarlatina, diphtheria, and other contagious and infectious maladies are reported. [It is hoped by this means that puerperal fever may be reduced in frequency, and that important statistics may be gathered which will throw new light upon this disorder.] Féré[2] points out that the general notion of the **sudden onset of marked symptoms of puerperal infection** after a longer or shorter period of silent incubation is inexact. Even in the period of incubation, important, although attenuated, symptoms may be present, and their recognition will greatly conduce to successful treatment. These early symptoms are slight elevations of temperature occurring once or twice daily, and usually in the evening; a pulse-rate of 80 or more, especially if in the morning, when the temperature is not yet raised; relative or absolute insomnia, which is a very important indication of serious infection and requires careful inquiry; headache, at first intermittent and slight, usually always in association with the other symptoms mentioned; sometimes diminution or suppression of the lochial discharge, although as a rule this is a later manifestation; and, finally, vague impressions of cold, but not usually a distinct rigor. The later symptoms, such as marked rigors, high temperature, local pain, etc., are well known; it is to the recognition of the early symptoms that we must trust for the successful treatment of such cases.

[1] Brit. Med. Jour., Sept. 17, 1900. [2] L'Obstétrique, II, No. 5, p. 425, 1900.

Phlegmasia Alba Dolens.—Funck-Brentano[1] remarks that the thoracic symptoms which are said to precede the swelling of the leg are not invariably present, but exist in over one-sixth of all cases. Of local precursory symptoms have been mentioned cramps and hydrarthrosis of the knee-joint, together with a local rise of temperature. It is better, however, to regard all these phenomena as initial symptoms rather than prodromes. Abdominal pains have been given as an initial symptom by many writers. In a case of the author's there was tenderness on pressure at a point corresponding to the location of the iliac vessels. Three days later painful edema supervened in the leg of the same side. Troesier ascribes this tenderness to beginning coagulation in the hypogastric or common iliac vein. Perhaps the most frequent of all symptoms, however, is a localized pain and tenderness in the affected limb, which usually considerably antedates the appearance of the edema. The points at which this tenderness may be educed are the groin, inner aspect of thigh, popliteal space, and calf. Siredey claimed that the groin was always the first to give evidence. Champetier de Ribes demonstrated the existence of a tender point in 41 out of 90 cases, viz.: calf, 27; thigh, 5; groin, 3, etc.; while in a number of cases the pain first appeared simultaneously at two points. The intensity of the pain varies greatly. It may prevent sleep and cause the patient to cry out, or it may be very slight, or consist only of tenderness on pressure. In manipulation for the purpose of locating tender points, we must always be very gentle, otherwise we may bring about embolism through the detachment of a portion of the thrombus which is forming. Phlegmasia dolens may, however, be painless. Lebrun, in his thesis upon this subject (1884), describes a case in which the phlebitis was apparently lighted up by the action of the midwife in endeavoring forcibly to deliver the placenta, much of which remained in the uterus, where it rapidly decomposed. Death resulted from pulmonary embolism, secondary to thrombosis in the hypogastric or iliac vein. The process extended to the femoral vein, and the leg was somewhat edematous, but free from pain and tenderness. In cases of this type death might result with little or no warning. Edema, which usually follows the pain, may, exceptionally, precede it. Unlike ordinary anasarca, it first shows itself high up and travels downward. Sometimes it is said to appear along the calf and diffuse itself in both directions. In many cases the edema corresponds to the sensitive or painful point. There is no definite proportion between the amount of edema and the degree of thrombophlebitis. We may find the femoral vein quite obliterated, yet but moderate edema; the latter may even be so slight that mensuration of both legs may be necessary to determine it. At the onset the edema does not pit on pressure, because the transudate is not merely localized in the subcutaneous tissue, but extends through all tissues alike. At a later period, after the collateral circulation is established, we get ordinary edema. The maximum of edema is attained in a few hours or a few days; but once established it may persist for months and even for years,

[1] Rev. Prat. d'Obstét. et de Ped., July, 1900.

during which it is provoked by standing and favored by recumbency, like ordinary cardiac edema. As implied by its name, the affected limb has a peculiar, smooth, whitish aspect, associated with the increase of tension; but exceptionally, when the superficial veins participate, we have the condition termed phlegmasia cœrulea dolens, or blue-leg. Hyperesthesia is associated with pain in some cases, a fact remarked by both Trousseau and Graves. There is an element of neuralgia in these cases. Observers are not agreed as to whether or not there is a local rise of temperature, or a fall, or no alteration whatever.

Treatment of Puerperal Sepsis.—H. Garrigues [1] gives the present status of the treatment of puerperal infection as follows: (1) *Injections:* Intrauterine injections demand a certain amount of skill not found in every legally qualified practitioner. He has seen cases in which injections had caused a rise of temperature, and the patients had recovered after the injections had been stopped. There is always danger of poisoning when corrosive sublimate is used. He has collected 23 cases of death attributable to the use of corrosive sublimate. At the beginning of the attack injections after cureting are useful. (2) *Cauterization:* When the wounds become diphtheric he applies a caustic composed of equal parts of zinc chlorid and water. Vaginal injections should be given every 3 hours, and the parts examined daily with a speculum, and if the diphtheric processes spread further, cauterization should be repeated. He prefers zinc chlorid applications to all other in such conditions. (3) *Aperient Enemas:* At the beginning of puerperal infection the bowels should be thoroughly cleared out. When peritonitis exists, he does not move the bowels except by occasional enemas, preferably soap-suds and ox-gall. (4) *Anodynes:* Pain is relieved by an opiate, local or internal, when necessary. To reduce temperature the local application of cold is best. Ice-coils are convenient. If the interior of the uterus is infected suppositories of iodoform are introduced into the cavity daily. Iodoform gauze is good for packing, but not for drainage. In the absence of uterine contraction, ergot by mouth and faradization of the uterus are indicated. (5) *Internal Antiseptics:* If the patient has been exposed to diphtheria, give diphtheria antitoxin. Antistreptococcus serum has apparently been proved not only useless, but harmful. He has not personally seen any good results from unguentum Crédè. However, it is at least harmless. A rational and useful modern method of combating sepsis is washing out the whole system by the injection into the veins of 1 or 2 pints of saline solution at short intervals. When vomiting is a prominent feature, cocain, hydrocyanic acid, or ice-coils to the epigastrium are indicated. (6) *Curetage:* If there is doubt about the placenta having been totally removed, the patient should be anesthetized and a systematic digital exploration of the cavity made, special attention being paid to the horns of the uterus. Any remains should be scraped away with the finger-nails, a far better method than using instruments. He does not think he has ever seen a patient recover when curetage has been resorted to

[1] Med. Rec., Jan., 1901.

after sepsis has become well established. He has found the curet a wellnigh indispensable instrument in cases of abortion. (7) *Abscesses:* When an abscess points above Poupart's ligament, a large incision should be made parallel to this ligament. Then the finger should be introduced, and, if necessary, thorough drainage established by way of the vagina. If an abscess can be reached easily through the vagina it is better to make a transverse incision behind the cervix and drain. If the latter is situated in the broad ligament it can be opened without entering the peritoneal cavity. (8) *Laparotomy:* Whoever has seen an autopsy on a person dead of diffuse peritonitis must feel timid about opening the abdominal cavity during life. Since the uterus is the starting-point (usually), gynecologists have been inclined to remove it; but to be of service this operation must be done before the general system is invaded. It is difficult to determine this, hence the operation is liable to be done too early or too late. In the hands of men of exceptional judgment and skill a few lives will occasionally be saved, but the average practitioner will best subserve the interests of his patients by abstaining from even such seemingly simple operations as intra-uterine injections and curetage.

Postpartum Hemorrhage.—J. W. Byers [1] discusses the pathology, causes, prophylaxis, and treatment of postpartum hemorrhage. He finds one of the most frequent causes of this condition is improper management of the third stage of labor. The two factors in this stage are the separation and the expulsion of the placenta. Nature should be allowed to separate the placenta, and then, if it is not equal to its expulsion, the accoucheur may interfere. The great mistake is an attempt made at once by the obstetrician to express the placenta from the upper or contractile part of the uterus. After delivery no attempt should be made to stimulate contractions, but the hand should be placed over the fundus of the uterus in such a way as to steady it and ascertain its condition. In from 20 to 30 minutes the uterus will be noted to rise from the pelvis, and swelling is detected over the pubis, due to a bulging forward of the lower uterine segment, and a few more inches of the cord is expelled. These signs show that separation of the placenta has taken place and has left the upper contractile portion of the uterus. If then pressure is made over the fundus during the height of the pain, the placenta is expelled. The most important of all prophylactic measures is to avoid delivery of the placenta in the absence of pains. In case hemorrhage supervenes, the first thing necessary is external uterine massage. By this means the uterus is stimulated, and it is often sufficient in itself to arrest hemorrhage. Should this plan fail, a hot douche through a a double-current catheter should be employed. The water should have a temperature of 118° F. and should be used in large quantities. The tube should be passed to the fundus, so that the entire inner surface of the uterine cavity is bathed with the hot solution. It is not necessary to add an antiseptic to the water, but salt, a teaspoonful to the pint, should be used. The introduction of the hand into the uterus is a very

[1] Lancet, Sept. 5, 1900.

dangerous proceeding, and should not be done except in cases in which it is necessary to separate the placenta or some of its parts mechanically. After the introduction of the hand the uterus should be carefully douched with a hot creolin solution. If these measures fail, bimanual compression may be employed, but it is very fatiguing to the accoucheur and trying to the patient. In such cases he prefers gauze plugging. The uterus should be drawn down by a vulsella forceps. Sterilized iodoform gauze is used for the packing, and is conveniently kept in sealed tins. Three or four lengths of 5 yards each, 4 inches in width, are commonly needed. If the uterus is properly drawn down less will be required in the packing. This depression of the uterus compresses the uterine arteries. Maygrier [1] states that by means of intravenous injections of normal saline solution about 50% of those women who, by reason of incoercible postpartum hemorrhage, are threatened with impending dissolution may be saved. He reports 7 successful cases out of a total of 15 occurring in his own practice. These injections are efficient only when given in massive doses,—1 to 2 quarts of a 1 : 1000 solution,—but should be restricted to cases in which intracellular injection has proved insufficient, or when the patient's condition becomes precarious, or again, in cases which prove very serious from the start; and they should be repeated if beneficial results fail to materialize and collapse reappears. In this manner several quarts of the solution may be injected in 24 hours. With the usual precautions and customary technic these injections are innocuous, and Maygrier concludes that no woman should be left to succumb to puerperal hemorrhage without an attempt at saving her life by this heroic plan of treatment.

PHYSIOLOGY AND PATHOLOGY OF THE NEWBORN.

Spoon-shaped Indentation in the Skulls of the Newborn.—J. M. M. Kerr,[2] in speaking of this interesting condition, remarks that in England and Germany odd cases have been reported, but in France, ever since Ambroise Paré first referred to the deformity, successive generations of obstetricians have interested themselves in the matter, and even now scarcely a year passes without one or more treatises or papers on the subject. The indentations are either spoon-shaped or furrow-shaped. The two varieties occur with about equal frequency. Their etiology is in the main the same, but the furrow-shaped variety is much less serious, and seldom gives rise to immediate trouble. The spoon-shaped indentations are usually situated in one or other parietal or frontal bone in the neighborhood of the anterior fontanel, and are by no means uncommon, especially in Glasgow, where rickets is so prevalent among the lower classes, and parturition is in consequence so frequently laborious. The accident occurs, with few exceptions, when there is a deformity of the maternal pelvis, generally in flat rachitic pelves. The extent of the pelvic deformity need not be extreme; most commonly it is just sufficient to cause a moderate degree of ob-

[1] Münch. med. Woch., Oct. 2, 1900. [2] Brit. Med. Jour., Dec. 22, 1900.

struction to the passage of the head. In the great majority of cases reported extraction was completed by traction, either on the child's head with forceps, or on the trunk if the presentation was a breech, or the child had been turned. In a small proportion labor terminated spontaneously. When a deformity of the pelvis existed, the indentation was usually caused by the head being pressed against the projecting sacral promontory; occasionally the anterior pelvic wall, and undue prominence of the iliopectoneal eminence, and still more rarely an osseous tumor of the bony canal, as in the case of Hoffmann quoted by Lelièvre. On the maternal side, apart from the deformities of the bony pelvis, there are very few conditions that have given rise to depressions of the fetal skull. Veit reported a case in a normal pelvis in which he attributed the cause to tetanic contractions of the uterus following the administration of ergot. Others have mentioned as causes lateral deviations of the uterus, contractions of the muscles of the pelvic floor, ankylosis of the coccyx, tumors of the soft parts, etc. Although abnormalities of the fetus but rarely cause such depressions, they might to some extent favor their occurrence. Defective ossification is a condition that certainly predisposes to the accident. Kerr recently made some experiments on the skulls of stillborn infants, and found that in some cases he could produce depressions with the greatest ease, while in others he could make no impressions on the bones, even if he used considerable force. On one living child he had noted that with the slightest pressure of the finger an indentation could be produced. Lelièvre cited a case described by Budin, in which twins were born with depressions on their skulls. The aftercoming head of the first child, which presented by the breech, was arrested by the presenting head of the second. Both children were born dead. A prolapsed upper limb might cause a depression. The exact part played by the forceps is difficult to decide. Certain furrow-shaped depressions might be caused by an oblique grip of the head, but it is very doubtful whether spoon-shaped depressions, which almost always occur in the upper part of the vault, are caused by the blades of the forceps. In the majority of forceps cases it is pressure of the head against the promontory of the sacrum, or some part of the pelvic wall, and not the blades, that is to blame. In a persistent occipitoposterior case Kerr has found a depression over the right frontal bone resulting from pressure against the descending ramus of the pubes on the left side. Most writers agree that forceps have directly very little to do with depressions. Boissard thought it was only when attempts at rotation are made that forceps can cause them. Depressions occasionally recur. Ahlfeld reported the case of a woman who had three children born with them, and Steinsmann reported one who had five. The prognosis is not unfavorable. The indentations as a rule disappear in a week or two, and cause no trouble immediate or remote. In some cases they remain a permanent deformity, sometimes with minor nervous storms. Sometimes the infants live for days, weeks, or months with marked local or general disturbances, ending generally in a fatal issue. The symptoms vary greatly.

In some there are twitching, convulsions, paralysis, etc. In others, only fretfulness, disinclination to take the breast, etc. Kerr narrates an illustrative case. In another group of cases the infant is either born dead or so deeply asphyxiated that if the indentation were not at once removed death would certainly follow. That the accident is serious the following figures show: Ahlfeld reported 10 cases with 2 deaths; Schroeder found, in 65 cases, 34% of the children stillborn, 15% died from the injury, and 50% remained alive, and, as far as could be learned, with few exceptions were well; Meuke reports 14 cases with 3 deaths; Kerr has seen 5 cases, of which 3 are still alive and well. In the way of treatment, exhaust pumps, cupping-glasses, and traction by what school boys call a "sucker" have been suggested. Lately Jennings trephined and elevated, but here there was no great urgency. In Boissard's case the depression was raised by making an incision through the scalp over the coronal suture, and a smaller one through the suture, passing a sound under the skull between it and the dura mater, and pressing out the depressed bone. In Panzani's case an incision was made through the scalp, then through the bone, and the depression was raised by passing an ear-curet along between the dura and skull. The oldest reference to operative interference was Tapret's in 1877, of which Boissard gives details. There was depression with fracture of the left parietal, left exophthalmus, right facial paralysis and convulsions. On raising the depressed and fractured bone the symptoms all passed away in 24 hours. Up to the present time such depressions have been left alone, except in the few recent cases just described. Kerr was inclined to adopt Boissard's method if the following new treatment, which he now first describes, and has found successful in 3 cases, failed. Very little force applied to the depression from the inside is all that was necessary. That force must be applied early. The following is a case in point: A mature female child of average size in a primipara, persistent occipitoposterior, was delivered by forceps in a slightly asphyxiated condition and with a deep spoon-shaped depression of the right frontal. The head was compressed anteroposteriorly, when the depression came out with a sound such as one hears when a dent in a felt hat is removed. Another successful case has been reported to Kerr by Dunning and Malcolm Black, in which death seemed imminent from depression of the left frontal. Kerr saw a third case not long ago in which again there was an indentation on the left frontal and in which anteroposterior pressure failed, but pressure in an oblique direction was successful. [The treatment proposed is simple, and certainly well worth a trial.]

On Incubators.—Baumm [1] publishes a review of this subject. He states that no matter how vigorous are the newborn, they all have a tendency to "cool off." They must be well wrapped to keep up their animal heat, and if this is not done the general health is bound to suffer. The child produces heat enough, but is unable to retain it on account of the relatively greater surface exposed in comparison with the adult, and also because of the defective regulation of heat. Premature children whose

[1] Allg. med. Zeitung, Apr. 4, 1900.

vital energy is below par are especially predisposed to subnormal temperature. [The first incubator was devised by Denucé, of Bordeaux, in 1857. Crédè's apparatus dates from 1864 and served as a model for many years. Toward 1880 Winckel devised a permanent water-bath for the newborn, but it was cumbersome. At about the same period Tarnier's incubator was introduced in France. Quite recently numerous improvements have been added to the older incubator and many new patterns have been introduced.] Baumm gives the preference to the "Lion couveuse." It is self-regulating as to the temperature, although discrepancies up to 2° occur, thought to be due to variation in the size of the gas flame. Baumm has made extensive researches concerning the Lion incubator. First, as to the draft of air admitted; he found that with an inside temperature of 37° C., 3300 cc. of air is admitted every second. In other words, the entire air of the couveuse is renewed at least once a minute. This amount of air is fully sufficient for all demands. The next test has reference to the amount of carbonic acid gas in the escaped air. After a child has been in the incubator 2 hours the gain in CO_2 in the waste air amounts to 0.16 per thousand. When we consider that the air expired from the infantile lungs contains 30 cc. of CO_2 per liter, we readily see how thorough has been the purification of the air in the apparatus. Special devices have been applied to moistening the air, but the simplest and best is a shallow dish of water on the floor of the incubator. What kinds of children should be placed within the incubator? The latter can only be of service in supplying warmth when it is in demand. As children of this sort are, as a rule, below weight, the usage of Crédè was to employ the incubator for all children whose weight fell below 2500 grams. Tarnier afterward made the limit 2000 grams. Eröss, however, has shown that the rule of selecting children by weight is open to objections. He showed by delicate measurements that at times very weak children produce sufficient animal heat while others of the same weight cannot be kept warm by packing. This latter class is adapted for the incubator when the temperature is below normal. There is a great difference, however, in this respect between infants having maternal care and those who must depend upon strangers. The incubator is especially designed for representatives of the latter class. Much difference of opinion exists in the proper temperature of incubators. The author has made especial efforts to determine this point. The temperature of the mother (37° C.) appears to be indicated in theory. But in practice this is too warm for many children, and should be reserved for the weaker alone. For the majority 34° appears to be the best figure. Should children lie half naked in the incubator? No. A light but complete covering is preferable on all accounts. What now has the incubator accomplished—what can it do? This question has never yet been sufficiently answered. Baumm's material is too small to furnish an answer. There were 12 children in all, all premature, weight from 1750 to 2300 grams. Most of them remained in the maternity but 9 days and had not recovered their initial weight when discharged. One child remained 42 days and gained 200

grams (initial weight 1880 grams). The children all appeared to be doing well in the incubator.

Asphyxia Neonatorum.—Schultze,[1] in the discussion before the International Medical Congress at Paris, states that the asphyxia of infants is due to the suspension of the reflex center in the medulla. Despite this abolition of the reflex, it can be reawakened by certain methods. This may be done by plunging the child in a cold bath, while at other times only oxygenated blood in the medullary circulation will suffice for this purpose. If the child is of a bluish-red color, if there is still some muscular tonus, Schultze leaves the child in communication with its mother, as long as the cord will pulsate. In the mean time the child's mouth is kept clean and the cutaneous reflexes excited. But if these measures do not produce reaction, Schultze cuts the cord and plunges the child into water which is quite cold, then plunges him into a vessel of hot water, and so alternately until the child gives a loud cry. But if at birth the child is pale and without any muscular tonus, the cord is tied immediately, the mouth is cleansed, and artificial respiration employed by Sylvester's method, or by the method of balancing which goes by his own name, afterward plunging the child into hot water. By this method it often happens that the heart's action begins to be manifest, the skin reddens, and the muscular tonus reappears. But if reaction does not set in, the balancing is resumed. If the newly-aroused breathing is superficial, the child is then plunged into cold water. Ribemont-Dessaignes spoke of the two forms, blue and white asphyxia, or better, asphyxia and syncope. The two indications are to clear out the respiratory passages and facilitate the admission of air. In mild cases simple swabbing of the throat and mouth with the finger wrapped in linen will suffice, while cutaneous frictions and alternate hot and cold immersion will excite the respiration. But in severe cases the speaker finds that instrumental insufflation is more trustworthy than any other of the last resort procedures. Care must be taken not to introduce more air into the lungs than they can receive. The speaker makes use of a special tube, devised by himself, for this purpose. Audebert has always found the results obtained by cold immersion to be satisfactory. Lepage alluded to the method of rhythmic tractions of the tongue as intended to supplant insufflation, but he preferred the latter method, and had never seen traction of the tongue save life after artificial respiration had failed therein. Wallich alluded to the vesical injuries found in autopsies of newborn children who died of asphyxia, and regarded this as an argument against methods like Schultze's. Draghuescia described the method in use at the Budapest Maternity in extreme cases. Incidentally an elastic sound is introduced into the larynx and all mucosities are aspirated. He also uses mouth-to-mouth infiltration, artificial respiration, and inhalation of oxygen. Rapin adheres to Schultze's method. Stratmann succeeded in showing by manometry that Schultze's method gives the greatest amplitude in the respiratory movements. Verrier simply raises and depresses the arms without resorting to oscillations.

[1] Jour. d'Accouchements, Sept. 9, 1900.

Calderini exhibited a special pattern of an insufflator, which does not require to be introduced within the larynx. Demelin stated that Tarnier had experimented with tongue-traction and found that the improvement was soon forfeited. Artificial respiration was then once more able to induce reaction. Schultze's method was useful in the blue asphyxia only. Pinard advocated that form of intervention typified by Schultze's method, together with the laryngeal tube. Charles stated that in blue asphyxia any method might succeed. As for white asphyxia, a child thus born might be reanimated spontaneously. He had seen cases of this sort come to after they had been laid away as dead. As for methods, the procedure of lingual traction has not much vogue among accoucheurs. The resources most used are clearly Sylvester's method, Schultze's method, and laryngeal insufflation ; but Charles prefers mouth-to-mouth, to any one of them. He has employed all the preceding methods side by side, and in unsuccessful cases had more air in their lungs ; in fact, in some of the children the lungs seemed to have breathed. To clear the passages of mucus nothing is so efficacious as energetic compression of the thorax between the hands.

Ophthalmia Neonatorum.—Greenouw [1] reports a study of the clinical and bacteriologic aspects of this disease in 100 cases. He finds that the inflammation of the eyes in the newborn, in simple conjunctival catarrh as well as in blennorrhea, is due to a variety of microorganisms, among which are the gonococcus, pneumococcus, Streptococcus pyogenes, colon bacillus, and yellow staphylococcus. He finds that the same patient may show in one eye a severe blennorrhea, while in the other the gonococcus conjunctivitis may assume the appearance of a simple catarrh. In general, blennorrhea due to the gonococcus is marked by a more copious discharge and is of longer duration than that due to other forms of bacteria. Damage to the cornea is confined to gonococcus conjunctivitis or occurs rarely in other forms. If a single careful examination before beginning treatment, or after a sufficient interval has elapsed since the application of an antiseptic, fails to reveal the gonococcus in the purulent discharge, the prognosis is entirely favorable. The discovery of the gonococcus in the discharge is a positive indication for the use of silver nitrate or some other silver preparation. In 3 cases presenting gonococcus blennorrhea of equal severity in the two eyes, one eye was treated with a 2% solution of the nitrate and the other with a 5% solution of protargol, and the pus was examined each day with counts of the cells showing gonococci. The results were practically the same in each case. In one case the gonococci disappeared from the eye treated with protargol 1 day earlier than from the eye treated with the nitrate. In the other cases the organisms disappeared from both eyes on the same day. [In this trial the solutions used were not so strong as are often employed, and the protargol solution may be regarded as relatively the weaker. Certainly in solutions of these strengths the protargol would be very much the less irritant, and probably it would do less damage if improperly applied.]

[1] Graefe's Arch. f. Ophthalmologie, Feb., 1901.

GYNECOLOGY.

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PRELIMINARY AND GENERAL CONSIDERATIONS.

An Unnoticed Factor in the Production of Abdominal and Pelvic Disturbances in Women.—J. C. Webster [1] remarks that symptomatology in women is often overlooked by the general practitioner. He dwells upon the normal relationship of the abdominal and pelvic contents, and proceeds to account for intraabdominal pressure, the pelvic organs being to a large extent maintained in their respective positions by reason of the pressure of the abdominal and pelvic wall. The average specific gravity of the viscera is very little more than that of water; the liver is 1.5 specific gravity. There is no proof that the mesenteries act as constant supports or were ever meant to be such; and the main factor in sustaining the viscera is the strength of the abdominal wall and pelvic floor. Local weakness of the abdominal wall has been fairly well described under hernia, while general weakness of the abdominal wall has been described as pendulous belly; the general weakness, in his experience, is an exceedingly rare condition. As to the question of etiology, the condition is found in women who have borne children; and on examination of the great majority of women there is some degree of separation of the recti muscles in the region of the navel. All evidence later on may disappear, but permanent widening remains. The result of all this is unavoidable enteroptosis, and it is generally to be found in women who have worn corsets. A common displacement is that of the right kidney. Webster dwells upon the diagnostic symptoms of these conditions, and then proceeds to describe the operation he performs for their relief. This consists in bringing the edges of the two recti into apposition. He first performed an operation for the relief of the condition in November, 1898; and since that time 41 cases have been operated upon, and the results have been most satisfactory.

Preventive Gynecology.—R. R. Smith [2] summarizes the various possibilities of preventive gynecology under the five headings of care of the woman before marriage, during gestation and labor, and during the climacteric, prevention of gonorrhea and syphilis, and prevention

[1] Jour. Am. Med. Assoc., Dec. 22, 1900.
[2] Am. Jour. of Obstet., XLI, 632, May, 1900.

of carcinoma. With regard to the two last named, carcinoma is to be prevented by the repair of all tears of the cervix occurring about middle life, and gonorrhea and syphilis by the diffusion of a knowledge of the risks run when a woman marries a man of loose habits. The care of the woman before marriage includes the making of a physical examination in all cases of persistent or severe pain at or between menstrual periods and of protracted amenorrhea without constitutional cause, also when there is menorrhagia without evident cause. At puberty the girl ought to have explained to her by her mother the fundamental facts of her reproductive functions. Care in pregnancy of course includes the examination of the urine. In labor surgical cleanliness is a *sine quâ non;* a judicious use of the forceps may be a most useful means of preventing future gynecologic mischief. Tears should be repaired. The woman should be examined 3 months after labor. [Minor pelvic surgery is the conservative gynecology of to-day; when this is recognized there will be less major or abdominal surgery.]

The Connection between Gastric and Uterine Disorders.—Ödön Tuszkai [1] has made a careful study of the anatomic and other factors subtending the well-known reciprocal relationships of stomach and uterus. The connection between the two is intimate and far-reaching, but care is necessary to exclude disorders which simply chance to affect coincidently both organs without being in any way interdependent. Three main channels of mutual influence lie open: through the nervous system, the circulation, and abnormal static relations. Of these, the first is the most important, and the author differs from the usually accepted belief in placing the genital center not in the brain or spinal cord, but in the sympathetic system, its abdominal center being not in the lumbar cord, but in the solar ganglion. This, by means of the inferior hypogastric, the solar, and spermatic plexuses, establishes the reflex tract between the uterus and the gastric branches of the vagus. Another more indirect route lies through the communications of the vagus with the sympathetic system through the uterovaginal plexus and the parauterine ganglia. In addition to the ligamentous and structural attachments of both organs, intraabdominal pressure plays a large part in maintaining their normal positions. Thus, under ordinary conditions this force strikes the uterus posteriorly near the fundus, keeping it normally anteflexed, but when the static equilibrium is disturbed or destroyed in consequence of gastric dilation, gastroptosis, etc., the axis of pressure may run directly through the fundus and induce a downward displacement, or lie still farther forward, and produce a retroversion. While chemic and endozymotic influences may travel through the blood-current and so affect reciprocal gastric and uterine changes, this channel is of less importance than the other two. [We agree with the author in attributing to the sympathetic nervous system more importance in the physical economy than is generally given. It probably has much to do with many of the obscure pelvic and abdominal conditions of women.]

[1] Monatssch. f. Geburtsh. u. Gynäk., Aug., 1900.

Relationship between the Uterus and Thyroid Gland.—Dicksons'[1] observations are based on some 200 cases, and from them he concludes that diseases of the thyroid are much more common among women than among men—6.55 to 1. A direct sympathetic relationship, if nothing more, exists between the thyroid and the uterus, and manifests itself in many ways. Thus, before the establishment of the function of menstruation, the thyroid is often enlarged. This enlargement frequently is reduced on the establishment of the menses, and in those cases in which the gland is not reduced it is observed that some thyroid engorgement is present before each menstrual period, diminishing as the flow is established. Goiter occurring after puberty is frequently associated with amenorrhea. When a woman with an enlarged thyroid becomes pregnant, the gland increases in size with each pregnancy, receding shortly after parturition. At other times pregnancy is directly responsible for goiter, it making its first appearance early after impregnation. The three periods in life during which the thyroid has been found most refractory to treatment are before puberty, during pregnancy, and after the menopause.

Medullary Anesthesia in Gynecology.—[As in obstetrics, so in gynecology and surgery in general, Bier's method of spinal cocainization has attracted considerable attention, although it has not as yet, and probably never will, come into general use.] J. Riddle Goffe[2] ably presents the present status of the method. He remarks that the various phenomena, the vomiting, sweating, the hurried respiration, and the excited pulse are aggravated in nervous patients; the apprehension of pain and the fear that something terrible is going to happen are much more common with women than with men, and it is permissible, therefore, to attribute the exaggeration of these symptoms to nervous excitement rather than to any untoward effects of the drug. Tuffier illustrated this fact in an operation which Goffe saw him perform on a young man of 23 years for an omental inguinal hernia with adhesions. In this case $\frac{2}{3}$ grain of cocain was injected and the patient lay as quiet and indifferent as to what was going on as he would had he been reclining in a barber's chair. The temperature present in a large proportion of cases is undoubtedly due to a mild form of sepsis, the infection being carried in by the needle as it passes through the skin. If this explanation is correct, the needle devised by Leonard Corning, in which he passes a smaller needle through a trocar thrust into the skin, would tend to avoid, if it did not completely obviate, the possibility of infection. The same object could be accomplished by the little procedure suggested by Bodine, of first incising the skin with a bistoury and passing the needle in at the bottom of the incision. The practical question suggests itself: When is this method to be used in preference to general anesthesia by ether or chloroform? Accepting Tuffier's dictum that the method is absolutely safe, is it as well for the patient? Many men as well as women suffer profound shock even from the sight of blood; in many the con-

[1] Boston M. and S. Jour., Sept. 13, 1900.
[2] Jour. Am. Med. Assoc., Nov. 17, 1900.

stant apprehension lest they might suddenly suffer great pain is a serious element of depression; and the conversation of the surgeons, the consciousness of some unforeseen accident in the midst of an operation, are the unfortunate factors in a surgical case. It is true that occasionally, perhaps frequently, conditions arise in the course of an operation in which it is important to know the desire of the patient in reference to extending the originally contemplated operation, and of course the spinal anesthesia affords an opportunity for this. Whether or not it will prove a safe method of anesthesia in cases suffering from heart-complications or kidney-involvement can only be determined by more extended experience. Tuffier has had 1 death in a series of 200 cases in which the method has been used, but autopsy confirmed the previous conviction that any other form of anesthesia was contraindicated.

Gynecologic Treatment of the Insane.—[Gynecologic surgery among the insane has reached the end of its sixth year in the London (Ont.) Asylum, during which time the work has been carried on in a systematic manner, but without much encouragement from the profession or the alienists in Canada. In the annual report on the asylums of Ontario just issued a summary is given of this work. During the year closed 55 of these cases have been operated on. Of these patients, 17 have recovered, 16 have improved, none has died, and so far as yet heard from 22 of the cases are unimproved mentally. It is fully expected that several of the 16 improved will get quite well. During the period of this work at London 286 female patients have been examined, generally under an anesthetic, and organic diseases have been found in some one or more of the pelvic organs in 243 of them. Only 43 of the entire number subjected to an examination have been found free from pelvic diseases. A total of 564 diseased conditions were found in 226 patients. "In the women's halls the average recovery-rate, including cases improved, for the 5 years 1886–91, calculated on the admissions, was 37.2%; in the next 5 years, 1891–95, it was 37.5%. But in the next 5 years, during which the gynecologic work was a factor, that is, in 1896–1900, the recovery-rate rose to 52.7%." The chief credit of this work belongs to A. T. Hobbs, who has never performed the operation merely for the insanity, but always for some actual, existing disease.] He remarks [1] that the most frequent type of ovarian insanity is that of mania. Sexual delusions are the exception, but when present are pronounced. As to why diseases affecting the organs of ovulation interrupt normal mental functions in so many of the female sex, it is difficult to conjecture. Plausible theories may be advanced as possible explanations of this phenomenon. Two theories are advanced as probable solutions, viz.: (1) *The Reflex Theory:* This theory hinges upon the fact that irritation produced in one organ by disease affects its numerous nerve-filaments, and from these through the nerve-plexuses connecting the various organs of the body it reflects its irritability upon one or more of the other organs. The brain, being but an integral part of the body, is just as liable to disturbance of its physiologic mental

[1] Canad. Pract. and Rev., Mar., 1901.

functions, as shown by various insane phases, as is the vomiting which is produced by a pregnant uterus. Insanity is very liable to occur in those whose brains are unstable in character, or who are afflicted by a hereditary tendency to mental breakdown when suffering from pelvic disease. (2) *The Internal Secretion Theory:* This is founded upon a theory advanced by some German physiologists who claim that there is "a normal and constant contribution of specific material by the reproductive glands to the blood or lymph, and thence to the whole body," and "this secretion reacts upon the rest of the organism through the nervous system." If this is true, the deduction may be made that the changed condition in the ovary brought about by pathologic changes would produce a pathologic secretion. If, therefore, the healthy ovarian secretion exercises such a profound effect upon the nervous organism in health, what must be the effect upon the nervous system when there are unloaded into the circulation noxious diluents of such unknown potency as the products of deranged ovarian functions? These theories are offered in explanation of how ovarian disease acts in producing mental alienation. J. H. Croom [1] considers that under no circumstances should any insane woman be operated on unless there is some distinct condition that is compromising life. Removal of ovaries and other operations with a view of influencing better conditions of insanity and hysteria are very unpromising. After degenerative processes have taken place in the brain, he considers it absolutely useless to look for any mental cure by any form of operative procedure. As regards the insanity from operation, his own records show 5 cases in a thousand abdominal sections. In looking for the causes of these mental disturbances after operation, the first factor was the hereditary one; the second possibly was sepsis; loss of blood, defective action of the kidney, etc., also had their influence in producing mental symptoms. In removing the ovaries the climacteric was induced and the woman placed in all the possible risks of that period. Probably a neurotic constitution is an essential prerequisite for the development of postoperative insanity. For illustration of the possibilities even without operation he reports a case of mental disturbance for menstruation, in a woman with good family history, in whom no operation had been performed. He calls attention to the fact that the normal functions of the uterus and ovaries are themselves not associated with mental aberration; alterations in the temper, actual hallucinations, disordered appetites of all kinds are occasional accompaniments of these perfectly normal processes. Bucke [2] says they examined 256 women at the London Asylum and found disease of the uterus, ovaries, or the adnexa in 219 cases. Operation was performed on 200 of these, resulting in 4 deaths. Of the 196 who recovered, 83 were cured of their insanity, 45 others were improved, and the remaining 68 are unimproved up to date. Among the 63 cases operated on for causes not gynecologic there was but 1 recovery from insanity. He further says the meaning of these facts seems to be that the diseased conditions under consideration—diseases of ovaries and tubes—have the most influence

[1] Lancet, Mar. 2, 1901.

[2] Med. News, Aug. 11, 1900.

upon the mental health of the patient; that is, the most influence in the causation of insanity; that disease of the body of the uterus and cervix comes next in importance as a cause of mental disturbance; that uterine tumors and tears of the perineum rank still lower, and that ordinary surgical diseases, such as hernia and tumors of the body at large, seem to have no influence at all as causes of such disturbance. No case was operated upon for insanity itself, but only when operation was indicated without reference to the mental condition.

Gonorrhea in the Female.—Sänger [1] states that in about one-eighth of all gynecologic diseases gonorrhea is the underlying cause. [Taylor, reviewing the condition from the side of the venereal specialist, says that this statement is conservative and probably nearly correct.] Gardner [2] writes as follows concerning the **treatment of gonorrhea in the female:** In the acute stages the patient must be kept in bed. The diet should be unstimulating, the bowels regulated by saline purgatives, and warm hip-baths and frequent soothing irrigation of the genitals employed. The use of linseed-tea by irrigation and douche is very grateful to the patient. The acute stage having passed, germicidal douches of permanganate of potash 1 : 5000, mercuric chlorid 1 : 5000 to 1 : 2000, or formaldehyd 1 : 4000 to 1 : 2000 may be employed. The toxic sublimate must be cautiously used. For the best results the vaginal douche must be administered in the dorsal position on the bedpan. If the patient lie still for a time afterward, there is in many women a tendency for a pool of the solution to remain in the vagina, from which it may be absorbed. The sublimate douche should therefore be followed by a small quantity of warm water. But the vaginal douche must be considered as merely accessory to the thorough application to the whole of the affected surfaces of the most effectual of all remedial agents—silver nitrate in strength of from 20 to 60 grains to the ounce of water. This cannot be done thoroughly in any other way than with the patient in the Sims position, through the Sims speculum. The surface to be thus treated must be wiped clean and dry, and the solution thoroughly applied by the swab with pressure till every part is whitened. If protargol and argonin are equally efficacious, they will be valuable acquisitions. They may be used in strength of from 1% to 3%. The urethra, and especially the Skene's tubules, the ducts of the Bartholin glands, and the cervix must be treated by applications of the same remedies. The urethra and cervical canal may be best treated by instillation of the solutions; Skene's tubules and Bartholin ducts, with a small, slender-nozled syringe. For all the accessible areas affected by the disease the use of a 5% to 10% solution of ichthyol glycerin is advocated by Bumm. This remedy may be used on pledgets of gauze or tampons left *in situ* in the intervals of the applications of the silver salts. In the treatment of the uterine cavity, in all but the most advanced chronic stage, local treatment by cureting, douches, etc., must be employed. In the early stage, instrumentation of the cavity of any kind is very apt to lead to extension

[1] Med. Rec., Jan. 12, 1901. [2] Montreal Med. Jour., Apr., 1900.

to the tubes and ovaries. Dalche [1] has found lactic acid an excellent medicine for the vaginal cavity. In 3 % solution it destroys the bad odor and greenish-yellow color of the leukorrhea, and diminishes the quantity of the discharge. It causes suppurative desquamation when applied in half-strength in endometritis and endocervicitis. [We have employed a 1 % solution of lactic acid in gonorrheal inflammation of the vagina with considerable satisfaction. Stronger solutions were found to cause suffering.] For suppurative bartholinitis A. Cuche [2] recommends the following treatment: The inflamed gland is fixed between the left thumb and index finger, punctured with a bistoury, the wound of which is enlarged to 1.50 centimeters with scissors, thoroughly evacuated and cleaned of its mucopurulent contents. Into the cavity a bit of potash pastile is introduced and left. The caustic soon diffuses itself naturally or more rapidly if at first it is crushed. The opposite labium majus must be protected with soft gauze. The next day the cavity is occupied by a black slough, which is the pyogenic membrane of the suppurated gland; this separates about the eighth day, and healing is present about the twentieth with an insignificant cicatrix. The patient need hardly cease her occupation.

AFFECTIONS OF THE VULVA, VAGINA, RECTUM, AND BREAST.

Kraurosis Vulvæ. — Heller [3] concludes his study of a case by expressing the opinion that kraurosis is a chronic inflammatory process in which no disease of the nerves can be demonstrated. It may be caused by irritants, especially chemic. Anatomically it is marked by disappearance of the fat and sebaceous glands in the deeper layers of the skin, while in the superficial layers hypertrophy of the tissues is noted, probably in consequence of the better nourishment of the subpapillary and suprapapillary cells. This rare but troublesome affection of the external genitals of the female, writes G. I. Himmelfarb,[4] occurs in adults from 20 years to old age, and in the virgin as well as the parous woman. Its etiology is not well known, though some observers give gonorrhea, syphilis, or continued irritation as the probable cause. It predisposes to cancer. The affection begins in the superficial layers of the skin, producing at first an inflammatory hypertrophy and hyperplasia of the connective tissues, edema of the dermis and epidermis, and degeneration of the elastic tissue. Later, this passes into the atrophic stage with marked retraction, blanched dry skin, and a thickened epidermis between the labia majora. The latter are shrunken, and the nymphæ appear as slight projections. The neighboring parts of the skin are shiny, dry, of a rose-gray color, and dotted here and there with white spots penetrated by bunches of vessels. The sebaceous and sweat-glands and the hair-follicles have almost disappeared. The parts are much retracted, and tear very easily; the walls of the vagina are smooth. The course

[1] Jour. Am. Med. Assoc., July 7, 1900. [2] Med. News, July 14, 1900.
[3] Zeit. f. Geburtsh. u. Gynäk., Bd. XLIII, H. 1.
[4] Ann. de Gynéc. et d'Obstét., June, 1900.

of the affection is slow, lasting some years, and the symptoms are burning sensations, marked pruritus, painful micturition, feelings of tension, and sharp pains. Owing to the retraction and narrowing of the vaginal orifice, coitus is difficult and painful, and may result in laceration, and severe tears accompany childbirth. The only treatment that so far has been effective is the extensive excision of all the parts involved.

Primary Tuberculosis of the Vagina.—This is of such rare occurrence that the report and conclusions by Jorfida [1] are of unusual interest and suggest many points for earnest consideration. [Ordinarily, tuberculous lesions of the vagina and vulva are secondary to infections higher up in the genital tract, and do not occur primarily; however, the reports of cases by Demme, Da Paoli, and others indicate the possibility of such infections. Demme has described cases in infants, in which the lesions were seated at the ostium vagina; and the primary character of the lesions was proved by the fact that these cases underwent radical cure. Schenk has described a case of primary tuberculosis of the clitoris which extended incidentally into the urethra. The patient, a child of 4, was cured by resection of the urethra and some of the anterior vaginal wall. Tuberculosis of the genital organs naturally suggests the responsibility of the physician in regard to the marriage of tuberculous individuals. If marriage takes place, the tuberculous wife runs the greater risk because of the prejudicial effects of pregnancy, parturition, and lactation upon the course of the disease. If the husband is the unfortunate victim, then the case reported by Murrell of tuberculosis acquired by a woman previously healthy and without tuberculous family history, from her husband, who had died of that disease, is very suggestive. The susceptibility of the female seems greater than the male, if we may judge correctly from the statistics of Weber, who followed up the fate of 68 tuberculous individuals who had married healthy men or women. Of the 29 sound males who married tuberculous females, only a few became tuberculous; but of 39 healthy women who married tuberculous men, no less than 18 became infected and the disease appeared to run its course with unusual rapidity.] Jorfida reports the case of a young married woman without any known family history of tubercle who shortly after being delivered of a child developed tuberculous ulceration of the vagina, with secondary glandular infection. The husband was healthy and free from any sign of tubercle. The woman showed no signs of tubercle elsewhere. The probable source of infection was a woman dying of pulmonary tuberculosis, whom the patient was in the habit of visiting before her confinement. The tubercle bacilli (which were found in the vaginal secretion and in the ulcer) probably first gained a foothold in the small laceration which took place during parturition. As no improvement followed ordinary medicinal treatment, the diseased surface was freely scraped and scarred with a cautery, after which cure followed.

Uterine Cough.—Schaffer [2] says that in those predisposed, such as neuropaths and sufferers from genital disease (especially during menstruation and pregnancy), cough may at times be induced by isolated

[1] La Riforma Med., Oct. 7, 1900. [2] Practitioner, Feb., 1901.

contact with the fornix vaginæ. In those so predisposed, pathologic processes which involve the broad ligaments, and especially Douglas's pouch, may cause reflex cough, just as they cause reflex acne, and hyperemesis. In the latter condition abnormal fermentation and autoinoculation are probably also present. In those predisposed to cough irritation of the lower third of the vagina and vulva can occasion only local reflex; nothing remote, such as a cough, can occur. Uterine cough is produced by irritation, on the one hand, of the uterovaginal fibers of the hypogastric plexus, which supply the fornix vaginæ and the cervix uteri, and on the other hand, by irritation of the spermatic plexus, hemorrhoidal nerves, and the ganglions embedded in the broad ligament which supply the fundus uteri and ovaries. Irritants which affect the pudendal nerve are at first localized in their reflex effects. Reflex phenomena may be (*a*) essential physiologic reflexes in remote motor and vasomotor territories, which, through the neuropathic basis, are easily set in motion; (*b*) radiation in the case of neuropaths, in whom resistance is weakened; (*c*) irregular radiation in high degrees of neuropathy. Cases of tuberculosis or predominance of stomach-symptoms play a separate part in the genesis of nervous cough. Local treatment, especially by pessaries, acts promptly when pathologic conditions are complicated, as in the case of retroflexion and prolapse and other conditions.

Dissecting Phlegmonous Perivaginitis.—This is a rare condition which has been described principally by Russian writers, but also lately by certain German writers. Von Lingen [1] gives a review of what is known on the subject. The name was introduced in 1864 by Markonett,[2] who claimed to be the first to describe the condition. The disease consists of a severe vaginitis, with sloughing and separation of part of the vaginal wall and of the vaginal portion of the cervix. He described 2 cases which developed simultaneously in young women without apparent cause. It was accompanied by fever, abdominal pain, and sanguineous discharge. At the end of a short time there passed from the vagina a kind of foreign body, consisting of a portion of the vaginal wall, and containing the mucous and muscular layers and the vaginal portion of the cervix. The two patients recovered. Minkevitch [3] next published a very severe case of dissecting phlegmonous perivaginitis which ended fatally. All the inner portion of the vaginal wall and the uterine neck came away. At the autopsy it was found that the anterior part of the rectum and the posterior part of the bladder had been destroyed. Somewhat later Wiegandt [4] had a case somewhat parallel to Markonett's, for here too the vaginal mucous membrane with a muscular layer came away in the form of a cylinder 7 centimeters long. The patient recovered, but presented marked contraction of the vagina. Syromiatnekoff [5] mentions a case observed by

[1] Ann. de Gynéc. et d'Obstét., Feb., 1900.
[2] Gaz. Méd. de Moscow, 1865, No. 4; Virchow's Arch., Bd. XXXVI.
[3] Virchow's Arch., Bd. XLI. [4] Petersburg. med. Woch., 1876, No. 37.
[5] Vratch, 1880, Nos. 29 and 30, and Arch. f. Gynäk., 1881, Bd. XVIII.

Tzirkownenko. The patient was 35 years old and passed a piece of tissue 10 centimeters long which presented an exact cast of the vagina and uterine neck. Tchernyschev [1] observed 2 cases in which there was more or less detachment of parts of the mucous membrane of the vaginal culdesacs and of the cervix uteri. The two patients recovered. In the first case the condition complicated typhoid fever, and left a rectovaginal fistula. The other case also accompanied some acute infectious disease. Dobbert [2] published a case complicating typhoid fever, in which the vaginal slough was 8 centimeters long, and he mentions 2 other cases which he had seen. Khanoutine [3] reports a case in which a slough 10 centimeters long was formed by the cervix uteri, and especially the right part of the vagina. The patient, who was 35 years old, was admitted for acute nephritis and for catarrhal pneumonia. She recovered with a contracted vagina. Weber [4] records the case of a patient, aged 38, who expelled a cylindric necrotic mass by the vagina, which was found to consist of the tissues of the vaginal wall. The patient recovered, but there was vaginal contraction. Streptococcus pyogenes was found in the pus. Among German authors Brose [5] seems to have been the first to publish a case of this condition. He showed a cylindric portion of vaginal wall 4.5 to 6 centimeters broad and 13.5 centimeters long. This was passed after pneumonia. Recovery followed. The only German author who mentions the disease in a systematic treatise is Veit,[6] who mentions it briefly. Bizzozero [7] also mentions a case in which a slough consisting of the vaginal wall and cervix was passed. Recovery took place. Liebermeister [8] gives 2 cases. In the first a rectovaginal fistula remained, and in the second a pelvic abscess opened into the rectum, and death followed. Basse [9] relates a case in which a similar separation of the vaginal wall and uterine cervix followed the use of tampons soaked with sesquichlorate of iron and zinc chlorid, and he quotes a case of Nammack,[10] who saw necrosis of the vagina follow cauterization with iron perchlorid (2 parts in 5). Bodenstein [11] has also published 2 cases. In one of these there was a perivaginal abscess which healed after incision, and he was of the opinion that this was an instance of an early stage of dissecting perivaginitis. Altogether, 17 cases are on record, 3 of which proved fatal. Of the 14 recoveries, there was in 8 a greater or less degree of vaginal contraction. In 5 cases typhoid fever was the cause, in 1 pneumonia, in 1 bronchial catarrh and fever, and in 2 local treatment by iron perchlorid. In 8 the cause was unknown.

To these von Lingen adds a case observed by himself. The patient

[1] Moniteur Méd., 1880, Nos. 50 and 51, and Centralbl. f. Gynäk., 1881, No. 35.
[2] Petersburg. med. Woch., 1890, No. 23.
[3] Gaz. d'Hôpital de Bothen, 1891, Nos. 32 and 42.
[4] Jour. d'Accouchements, 1896, No. 12.
[5] Zeit. f. Geburtsh. u. Gynäk., Bd. XXIV, 1892.
[6] Handb. d. Gynäk., Bd. II, S. 318.
[7] Ann. de Gynéc., 1875, p. 235.
[8] Handb. d. speciel. Pathol. u. Therap. v. Ziemssen, Bd. II.
[9] Arch. f. Gynäk., Bd. LVI, H. 3.
[10] Schmidt's Jahresber., 1895, J. XXIX, Bd. II.
[11] Monatssch. f. Geburtsh. u. Gynäk., 1898, Bd. VIII, H. 6.

was a married woman of 39, nulliparous, a laundress; no cause is assigned. She complained of pain in the back and epigastrium, and of fever for 8 days, and of leukorrhea, which had not been offensive. She seemed strong and of good constitution. The vagina was capacious. In the situation of the cervix uteri there was a soft sponge-like body, and in the culdesac and the upper part of the vagina there was a similar spongy sensation. The uterus was anteflexed and normal in size; the appendages were normal; there was nothing abnormal in the periuterine tissue. By the speculum the cervix was seen to be transformed into a dirty gray, soft gangrenous mass, in which the labia uteri could nevertheless be distinguished, and the os externum. The gangrenous process had reached the culdesacs and affected a large part of the vaginal walls, covering two-thirds of the posterior wall and extending to the anterior and lateral walls also. A well-defined line of demarcation separated the healthy and gangrenous tissue, which could be easily detached from the healthy tissue, a little bleeding being caused. There was a dirty gray fetid discharge. The treatment consisted of vaginal irrigation and tampons of iodoform gauze. In the discharge were found staphylococci and streptococci, separated and in groups, and degenerated cells of pavement epithelium. On the third day after admission a large slough with ragged edges came away; it measured 10 by 4 centimeters, and was 1.5 centimeters thick. Its color was dirty gray, almost black in some places. This portion of tissue was an exact mold of part of the vagina and of all the cervical portion of the uterus, with an aperture corresponding to the os externum. One surface was uniform, the other rough and spongy. After this had come away the uterine neck looked like a small nipple-shaped process of bright red color, and the vagina presented the appearance of a recent wound. This healed by granulation and cicatrization. Microscopic examination showed a structureless homogeneous tissue staining feebly, with scattered fibers of connective tissue and occasional vessels in a state of thrombosis. On staining by Gram's method there were found quantities of streptococci in groups and in chains. The streptococci were abundant on the surface, around the thrombosed vessels, and in the thrombi. [The fact that the slough included not only the vaginal wall but also the cervical portion of the uterus deserves special consideration; so also does the curious limitation of the inflammatory process, for there is no anatomic barrier to the spread of phlegmonous inflammation to the pelvic tissues generally. Anatomic and embryologic researches have sufficiently established the fact that the vaginal portion of the uterine neck must be considered as an integral part of the vagina. This is well shown in a recent work by Werth and Grousder.[1] In addition to this, the distribution of the arterial supply to this part is of significance. A special branch of the uterine artery, the cervicovaginal branch, is distributed to the vagina and cervix, anastomosing with its fellow. The lymphatics are disposed like the arteries. The distribution of the veins is less characteristic.[2] Hence it seems very likely

[1] Arch. f. Gynäk., Bd. LV, H. 2. [2] See Nagel, Arch. f. Gynäk., Bd. LV, H. 2.

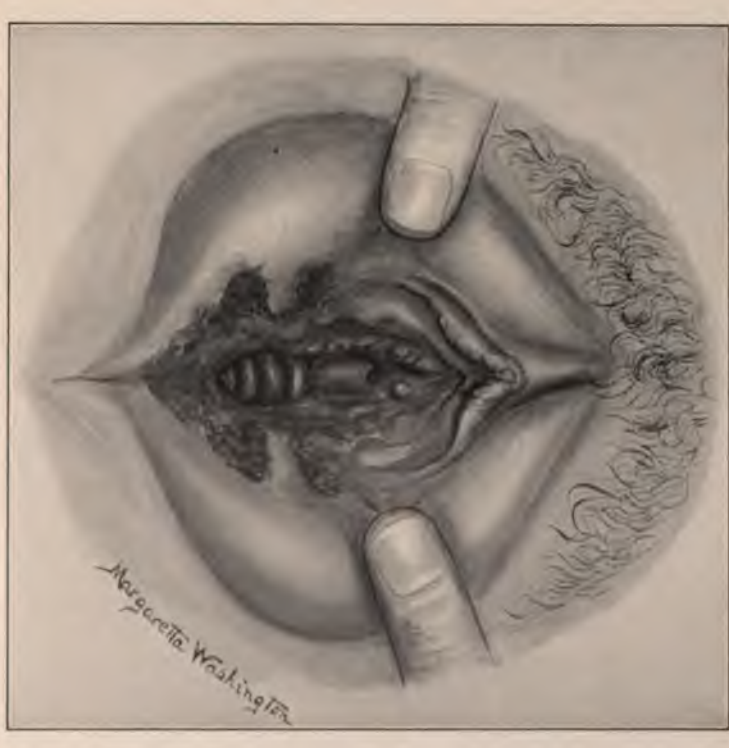
that embolism or thrombosis of this arterial tract may be the cause of the localized necrotic process. It is a hemorrhagic infarct. Hemorrhagic uterine infarct is very uncommon, owing to the four large blood-vessels which supply it and their free anastomoses. But a diseased condition of vessels might favor infarction.] Von Lingen concludes that "there is in dissecting phlegmonous perivaginitis an obstruction of the vessels which nourish the vaginal portion of the cervix uteri and the upper parts of the vagina. As the vessels are distributed around the circumference of the cervix and vagina, the necrosis extends in circular manner in the tissues." This explanation suits almost all the cases, except perhaps those due to the employment of iron perchlorid.

Tumors of the Vulva and Vagina.—Noble [1] reports 2 cases of epithelioma of the vulva, one occurring in an old lady, aged 63, and the other in a woman of 30. Sippel [2] describes the following operation which he performed successfully in a case in which the entire vagina was transformed into a narrow rigid tube through cancerous infiltration of its walls. An incision was made on the left side of the introitus between the anus and tuber ischii, the ischiorectal fossa being freely opened. The left lateral and posterior vaginal walls were separated by blunt dissection as high as the attachment of the levator ani, all bleeding vessels being ligated. The incision was then carried around the introitus and the urethra separated. The lower end of the vagina was then clamped and drawn downward, while the rectum and urethra were protected by retractors, which separated the upper and lower edges of the wound so that the relations of the organs in the pelvis could be easily studied, and the bladder and uterus pushed upward. The bases of the broad ligaments, with the uterine arteries, were ligated and divided; then the posterior fold of peritoneum was opened, the uterus returned, and finally the ureterovesical fold was incised and the upper portions of the broad ligaments were ligated. The adnexa, being normal, were not disturbed. The uterus and vagina having been removed *en masse*, the stumps were brought down and sutured in the angles of the wound near the introitus, so that the lateral raw surfaces were covered with peritoneum. The anterior and posterior peritoneal edges were also attached to the introitus, and the external wound was sutured, a small opening being left, which was packed with gauze. The operation was completed in an hour, only a moderate amount of blood being lost. Recovery was afebrile. The patient was up at the end of 3 weeks, the wound having healed entirely, without any disturbance of the bladder or rectum. [The advantages of the procedure are the fact that the field of operation is perfectly visible and accessible, while the vagina and the cancerous tissues are excluded from contact with the wound.]

Gruzder [3] reports 3 cases of **fibroma of the vagina,** and analyzes 85 which he has collected from the literature. Twenty-five patients were nulliparas. The youngest was 15 months, and the oldest 71 years.

[1] Am. Jour. of Obstet., Aug., 1900. [2] Centralbl. f. Gynäk., 1900, No. 4.
[3] Vratch, 1900, Nos. 8 to 10.

PLATE 2.



Epithelioma of the vulva (Noble).

The anterior vaginal wall was most often affected, the tumor usually developing from the submucous layer. These neoplasms are usually fibromas, and are rich in blood-vessels and lymph-vessels, hence the frequent occurrence of interstitial hemorrhage and suppuration. They are usually encapsulated. They grow slowly and rarely reach a considerable size, the largest recorded being 10 pounds. The symptoms due to these growths are largely mechanical, varying with their size. They are most apt to be mistaken for cysts, the diagnosis being made by explorative puncture. Interstitial fibromas are difficult to distinguish from similar growths in the lower uterine segment, dermoids anterior to the uterus, and echinococcus cysts of the pelvic connective tissue. Tumors in the vaginal wall as they enlarge tend to encroach upon the canal, which is not true with paravaginal neoplasms. Pedunculated sarcomas would only be recognized on microscopic examination unless they cause constitutional symptoms. While the prognosis is usually favorable, these growths may suppurate or undergo malignant degeneration, while if they attain a large size they may cause dystocia. The removal of polypoid tumors is simple, but the enucleation of interstitial fibromas may be quite difficult and attended with hemorrhage and suppuration.

Neuralgia of the Rectum.—S. G. Grant [1] calls attention to the not infrequent occurrence of neuralgia of the rectum. In the majority of cases the cause has been either a deviated coccyx or an impaction of feces. In every case of doubt, he says, one should search diligently for fissure, ulcer, hemorrhoid, tight sphincters, or displaced coccyx. In the treatment one should endeavor first to correct any abnormality, keeping the bowels open and having the patient rest quietly in bed. Frequent irrigation of the rectum with water or oil as hot as can be borne, or dry heat over the seat of irritation, will lessen the pain. In one case permanent relief was given by a thorough cauterization of the skin over the affected part with the Paquelin cautery. However, a reliable counter-irritant for all cases is hard to find, so one may try several, as aconite, chloroform, capsicum, camphor, turpentine, iodin, and the oil of mustard. Electricity is valuable in some cases, the static current giving the best results. Forcible division of the sphincters may give relief. He reports one case in which perfect results followed complete division of the sphincters after other means had failed.

Suspension of the Rectum (Proctorrhaphy) for Intractable Prolapse.—C. P. Noble [2] describes this procedure. Incision is made through the left rectus muscle (Fig. 79), and the rectum or sigmoid found and pulled on till the prolapse is undone. Three or more fine silk sutures are passed under the anterior longitudinal band of the rectum, and include a portion of the rectus. The abdominal wall is closed in layers. Two cases are recorded. Case 1: A woman aged 35 had trouble for 5 years; she was reported well nearly two years after the operation. Case 2: A woman aged 19 had trouble for 3 years, and her sphincter was found paretic; 7 months after the operation she complained of re-

[1] Postgraduate, Jan., 1900. [2] Am. Gynec. and Obstet. Jour., Dec., 1900.

lapse, but the rectum was found in good position, and she had been neglecting the proper care of her bowels. R. Morison [1] describes the operation of abdominal resection of the sigmoid or upper portion of the rectum. This operation was intended for cases in which suppuration of the left uterine appendages involved the bowel to such an extent as to demand its removal, or in which the abdomen was opened for a cancerous growth of the sigmoid in mistaken diagnosis for a diseased and enlarged ovary. The steps of the operation were: (1) The diseased

Fig. 79.—Proctorrhaphy, Noble's method.

bowel was excised; (2) a glass bobbin, with an India-rubber tube attached, was tied tightly into the upper end of the sigmoid flexure; (3) the India-rubber tube was passed down from above through the lower cut and into the rectum, where it was aided to pass through the anus by the finger of an assistant; (4) the tube was drawn upon till the ligature on the upper cut end of the bowel was inside of the lower cut end of the bowel; (5) a ligature was then passed round immediately below the lower cut end and tightly tied (this made the junction water-tight); and (6) the tube was again pulled upon, whilst the lower portion of the

[1] Lancet, Nov. 17, 1900.

bowel immediately below the button was steadied till by traction from above a short intussusception was produced. This was maintained by a few Lembert sutures. In from 4 to 8 days the ligatured sloughing bowel separated and the tube was thus released. He has done this operation 14 times—in 2 cases for complicated pyosalpinx and in 12 for malignant disease. Seven patients died. The percentage mortality is therefore high, but might be diminished by avoiding the mistake he has made of performing this operation in cases of obstruction with loaded colon, for experience has taught him that in these cases the colon should be emptied by a preliminary colotomy before a radical operation is attempted.

PERINEORRHAPHY.

H. Fritsch [1] makes the following points regarding this operation. Two principles are vital.: (1) Remove no tissue if possible, sacrifice nothing while in the old sense "freshening" the wound, but rather divide so as to approximate the proper parts each to each. (2) Unite with accuracy the torn ends of the sphincter. The first-named is easy to attain in recent cases, when the freshly-lacerated tissue can still be brought together and is in itself scar-free; but when the tear has existed some time, and especially when one or more operative attempts at repair have failed, the amount of cicatricial tissue is so considerable that the work becomes at once difficult. The vagina and rectum are often adherent and the external sphincter reduced to a functionless semicircular muscular band. The two **viscera must at first be freed,** each from the other, then the rectum sutured, next the intervening connective tissue, and finally the vagina with the skin. Often the sphincter will be found so contracted that the little finger can scarcely be passed into it, and it forms a barrier for gas, mucus, and feces. These collect in the ampullæ recti above, also contracted by disuse, and soon force the wound open again completely or partially, or, invading the new perineum, cause fistula. For such cases at the time of the operation a rubber tube wrapped with gauze may be inserted through the anus to act as a vent. Simon has suggested and the writer has tried division of the sphincter in the middle line posteriorly toward the sacrum as a preliminary step in the operation, but this results in a painful granulating wound. Hence the author now **divides the sphincter after the plastic work is completed** subcutaneously. The results show that function returns as well as it does after fistula-in-ano operations. For the deep sutures nonabsorbable material is recommended.

Goffe [2] remarks that in operating upon an **incomplete laceration** he denudes the necessary area by beginning at the lateral caruncles. This enables the operator readily to strike the line of cleavage. His first two sutures carry the rectocele up into the vagina, and the next suture, sweeping round widely into the tissues, catches the separated ends of the transverse perineal muscle. The same general method is pursued for complete lacerations, but before passing the sutures he sews

[1] Centralbl. f. Gynäk., Jan. 12, 1901. [2] Med. Rec., Mar. 16, 1901.

up the rectal wall with an interrupted suture of very light catgut. The sutures are tied on the rectal side, and are expected to come away when the bowels first move. They are intended to secure good coaptation only temporarily. The last two sutures inserted in this operation take in the ends of the sphincter muscle. He has used this operation for a number of years, and has found it very satisfactory.

A Simple Leg-holder.—J. Kalabin [1] describes a simple device, applicable to any ordinary four-leg table and in any household, for examinations, treatment, and operation. The patient is placed upon any table so that the buttocks come just beyond one end. With towels or sheets tied together to form a rope, the lower extremities, held in universal flexion by an assistant, are maintained so by fastening the rope first to one leg of the table at the patient's head, passing it directly to the thigh of that side and about it once just above the knee, thence across to the opposite side, where the other thigh is secured in the same manner, and the rope finally tied to the other leg of the table at the woman's head. The distance between the thighs and the flexion of the thighs on the abdomen are easily variable. The simplicity and readiness of this means commend it. The writer has given it long trial with entire satisfaction.

CONDITIONS OF THE CERVIX UTERI.

A New Method of Cleaning the Cervical Canal.—G. W. Newton [2] remarks that the difficulty experienced in trying to remove the secretion from the cervical canal before making applications thereto caused him to seek other methods than theories heretofore advised. He had a brush made as shown in the cut, and the ease with which the canal can be cleaned is really surprising. It does its work perfectly, and removes equally as well the thick, yellow gelatinous gonorrheal plug as it does one of the hematogenous variety of endocervicitis. The brush is cylindric in shape, $1\frac{1}{2}$ inches long, $\frac{1}{4}$ inch in diameter, tapering

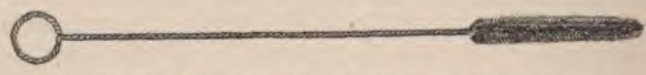


Fig. 80.—Newton's brush for cleansing the cervical canal.

to $\frac{3}{16}$ inch. If the patient is a nullipara and has a small cervical canal, a smaller brush should be used. With a pair of scissors it is a simple matter to trim the bristle off to any size desired. Several sizes should be kept on hand; as they are very inexpensive, the cost is a matter of small consideration. The brush is inserted into the cervical canal to the internal os, revolved once or twice and then withdrawn, and the membrane lining the canal will be clean. The discharge becomes entangled in the meshes of the brush, and adheres to it as it is withdrawn. To clean the brush hold it under running water for a few moments. It can be sterilized in the usual manner. [Although

[1] Centralbl. f. Gynäk., Nov. 17, 1900. [2] Jour. Am. Med. Assoc., Jan. 26, 1901.

simple, this brush may be found to be a very useful instrument. The uselessness of applications to the cervical canal is often due to the fact that the medicament is not applied to the membrane, but to discharges which filled the canal and which it was impossible to remove.]

Tracheloplasty.—H. P. Newman [1] describes in full his operation of tracheloplasty, which, he claims, should supplant the operation of amputation of the cervix, as follows: The patient, being surgically prepared, is placed in the lithotomy position and the cervix is drawn down with a vulsellum-forceps, thereby bringing the uterus well into view. The cer-

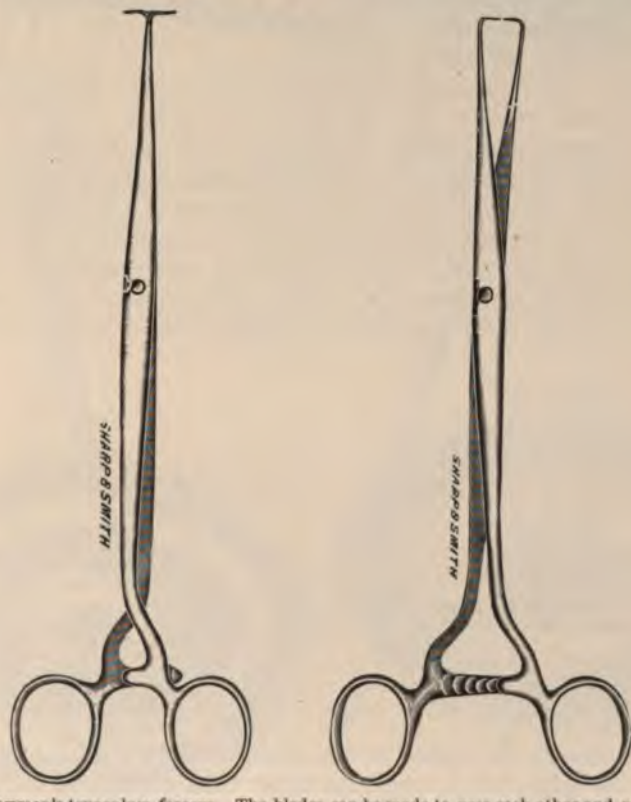


Fig. 81.—Newman's tenaculum-forceps. The blades can be made to pass each other and point outward without unlocking.

vix is dilated and the uterus cureted if indications for curetage exist. These are, however, so nearly constant as to make it practically the rule. The cervix being drawn down with the bullet-forceps or a double tenaculum, the blades may be reversed and replaced within the cervix so that their points are directed laterally from within outward. He prefers to use the specially devised instrument which is shown here (Fig. 81). By using it in this manner traction is made upon the inner area of the cervix, leaving the anterior and posterior walls free for mak-

[1] Jour. Am. Med. Assoc., Apr. 20, 1901.

ing the flaps. The cervix is now transfixed by this special knife (Figs. 82, 84), and a clean cut made from above downward, first in the posterior lip. The anterior lip is transfixed in a similar manner about 1 to 1.5 centimeters in front of the other and cut in the same way. The intervening plug of diseased tissue is now removed by a single cut or two of the curved scissors, the bullet-forceps having been changed to a lower position to allow it (Fig. 83). The flaps thus made will now fall together and inward so as to assume the appearance of a normal cervix, and will require only the simplest suturing to keep them in this position (Fig. 86). The first suture

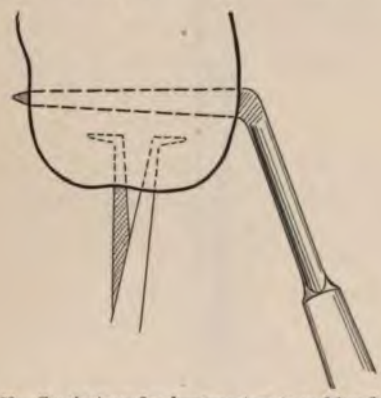


Fig. 82.—Cervix transfixed preparatory to making flaps; forceps readjusted within cervix.

Fig. 83.—Formation of flaps; plug of pathologic tissue grasped by forceps and ready for excision with curved scissors just above the tenaculum points (Newman, in Jour. Am. Med. Assoc., Apr. 20, 1901).

is passed through the center of the anterior flap a centimeter or more from its cut edge, and brought out about three-fourths of a centimeter

Fig. 84.—Right-angled or tracheloplasty knife.

within the cervical canal. Two parallel stitches are now placed at each angle of the cervical canal. Silkworm-gut is the suture material com-

monly used, and the employment of this fixed needle and holder (Fig. 85) renders an otherwise difficult procedure quite easy. The posterior lip is treated in the same manner, except that here it is easier to pass the sutures from within outward, while the reverse is true in sewing the anterior lip. Two sutures are now passed, as in trachelorrhaphy, through the outer angles of the wound, which gape slightly after the turning in of the flap.

Fig. 85.—Needle with fixed holder.

For nice adjustment of the stitches and for ease in removal Newman is in the habit of treating them this way: In tying the sutures, one end of each is left long and these long ends are grouped by tying them together according to their location. The three anterior sutures form one group, the three posteriors one group, and the two lateral sutures are tied together, a pair on each side, making four groups in all (Fig. 87). A uterine tampon of iodoform-gauze or wicking is now inserted by means

Fig. 86.—The plug of the tissue is removed and the flaps falling inward are ready for stitching (Newman, in Jour. Am. Med. Assoc., Apr. 20, 1901).

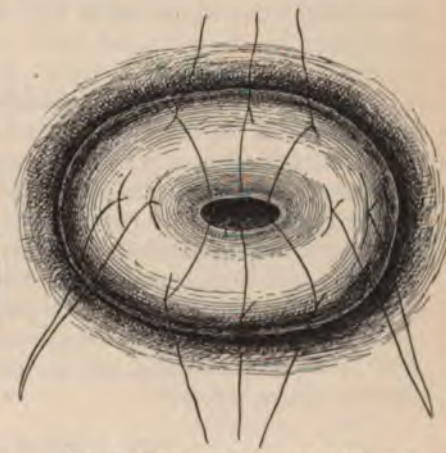


Fig. 87.—Showing stitches *in situ* and manner of tying in groups (Newman, in Jour. Am. Med. Assoc., Apr. 20, 1901).

of the forceps and tampon-carrier (Fig. 88), a projecting strand being attached to the vaginal gauze-tampon in order that both may be removed without undue disturbance of the parts. If no accessory work is done, the usual perineal dressings are applied and the patient put to bed. The external genitals are bathed with antiseptics after micturition, but no douching of the vagina or disturbance of tampons is allowed until the second or third day, when the entire tampon is removed and not replaced. Vaginal douches of 1 : 4000 bichlorid are then used twice daily. The

sutures are removed at the end of 2 weeks, when the patient can be up. The advantages of this method are: (1) Quickness and ease of operating by the knife here presented, the manner of making the flaps transcending in certainty and safety of execution the ordinary methods of excision. (2) Clean, smooth-cut surfaces, obtained without haggling of tissue. (3) The easy approximation of the flaps and the avoidance of all hemorrhage beneath them by deep placing of the sutures and compression of the flaps. (4) The accurate approximation of mucous mem-

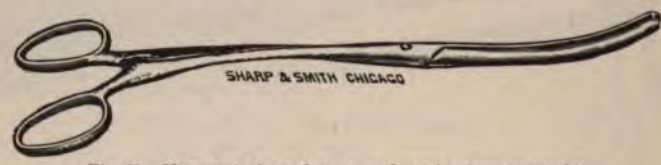


Fig. 88.—Newman's tissue forceps and uterine tampon-carrier.

brane to mucous membrane, thus avoiding granulating surfaces, formation of cicatrix, and constricting of the canal. [This feature, which also pertains to Schroeder's operation, is of great importance and a decided advantage over trachelorrhaphy, especially when the entire mucous membrane is removed.] (5) The certainty of obtaining a permanently patulous canal and a well-formed cervix, with pronounced reduction of the hyperplastic uterus. (6) The simplicity of the after-treatment.

UTERINE ANOMALIES OF DEVELOPMENT.

Castration in Rudimentary Uteri.—Eberlin [1] reports a case of rudimentary uterus in which the operation of castration was performed on account of severe attacks of abdominal pain. The patient, a married woman, had never menstruated, and intercourse was impossible on account of an undeveloped vagina. The uterus was absent, but the ovaries could be palpated. The latter were removed and the menstrual molimina ceased entirely. The writer has collected 21 cases in which the operation was performed, all but 2 being successful. One patient died of septic peritonitis, and the other continued to suffer from general nervous disturbances.

FISTULAS.

Vesicovaginal Fistula.—Spassokonkozky [2] describes the following method of closing a fistula: Several sutures are passed between the vaginal and vesical mucosa. While traction is made upon these a bistoury is introduced between the sutures and the vaginal mucous membrane and a flap is dissected off. The sutures are then threaded in the eye of a catheter and are drawn through the urethra and out at the meatus. The vesical flap is thus inverted into the bladder, while the vaginal edges of the fistula are easily approximated, after which the

[1] Zeit. f. Geburtsh. u. Gynäk., Bd. XLII, H. 1, 1900.
[2] Centralbl. f. Gynäk., 1900, No. 25.

temporary sutures are withdrawn per urethram. This method was employed successfully in 5 cases. Veber [1] describes a complicated case of fistula resulting from gangrene of the vagina, in which, after two failures, he succeeded in closing the fistula by taking skin-grafts from the inner surface of the thigh.

Intestinovaginal Fistulas.—Condamin and Voron [2] state that intestinovaginal fistula is not infrequently observed after operation on the pelvic organs. Such a fistula is sometimes the result of an abnormal communication between the intestinal canal and a purulent collection (inflamed dermoid cyst or suppurative annexitis), established before the date of surgical intervention, and in other instances is caused during the operation either by laceration of the intestine in breaking-down adhesions, or by puncture with a trocar, or wounding with a cutting-instrument. The authors regard this lesion as by no means a serious one, and state that the fistulous communication nearly always heals spontaneously and in a short time. In the rare cases in which the fistula persists it may be closed either by cauterizing the fistulous track or by laparotomy and intestinal suture. The benignity of intestinovaginal fistula, if considered with regard to the equal frequency and the much greater gravity of stercoral fistula following laparotomy, constitutes, it is held, an important argument in favor of the vaginal method in the treatment of inflammation and suppuration of the pelvic organs.

Results of Implantation of the Uterus in Treatment of Fistulas and Procidentia.—Freund [3] reports the remote results of operations for the repair of complicated genital fistulas and procidentia, in which the uterus was retroverted into the vagina and the cervix sutured in the wound. In young women menstruation appeared for a few times and then ceased entirely, the uterus undergoing atrophy. No incontinence of urine or feces was noted. The patients were permanently cured, so that they could perform the most severe labor. Coitus became impossible except in one instance. The indications for the operation, as stated by the author, are: (1) Extensive loss of tissue, complicating vaginal fistulas; (2) complete procidentia, of unusual degree, in women after the climacteric. [In any case it is assumed that the uterus must have lost its functional activity.]

THE URINARY ORGANS.

Prolapse of the Urethral Mucous Membrane.—Voillemin [4] attributes this condition to unusual laxity of the submucous connective tissue, which is normally abundant. The mucous membrane slides downward till it appears at the meatus as a more or less circular pad. This disorder is met in children from 2 to 12, and in women between 50 and 75; it is exceptional in adults in the prime of sexual life. The predisposing causes are said to be weakening of the tissues concerned from different reasons, frequent child-bearing, and senile involution.

[1] Vratch, 1900, No. 28.
[2] Arch. Prov. de Chir., June, 1900.
[3] La Gynécologie, Feb. 15, 1900.
[4] Thèse de Paris, 1900.

The most common exciting cause is straining in coughing, defecation, and micturition. Hence prolapse occurs very rapidly in some cases. Vulvovaginitis, urethritis, and injuries appear to have some influence in causing this disease. The first symptom is dysuria; straining, to which the patient naturally resorts, increases the obstruction by forcing down more mucous membrane. A little red projection is then to be detected, generally on the posterior edge of the meatus; sometimes a second lies on the anterior edge; the two puzzle the observer as to their nature. More rarely at this early stage a complete circle of mucosa comes down, an appearance easier to interpret correctly. When established, the prolapse causes sharp pain, not only during micturition, but also in walking, and in making any effort. Coitus becomes very painful. The prolapse bleeds during micturition and at other times, but never severely. When advanced, the everted mucosa becomes edematous and very painful, small areas of slough develop, and may cause severe bleeding. Diagnosis is easy when the prolapse is complete, as a probe can be passed through the center of the red swelling, but cannot be pushed at any point between the swelling and the urethral walls. At an early stage reduction of the prolapse is often sufficient if a compress be applied, and the patient kept at rest. Astringent lotions may prove beneficial. Cauterization is less satisfactory, and ligature is not to be thought of. The thermocautery or galvanocautery may be used for the removal of the mass, but excision with scissors, followed by suture of the edges of the mucous membrane to the border of the meatus, is the best proceeding for the permanent cure of a large prolapse.

Incontinence of Urine.—In women, says an article in the "American Journal of Surgery and Gynecology," incontinence of urine due to prolapse of the urethral mucous membrane and relaxation of the urethral muscles may sometimes be cured by the following method: Under cocain the redundant mucous membrane is cut away, and the wound sutured with fine catgut. The mucous membrane is then split up to near the vesical entrance, and a strip about $\frac{1}{8}$ inch is removed down as far as the meatus. Three catgut stitches are then introduced into the deeper tissues around the urethra, and tied so as to close the wound. A Nélaton catheter is then introduced and left 2 days. If healing by primary union be secured, immediate cure may be effected; if not, a later cure may result from contraction of the scar-tissue thus produced. R. Gersung[1] describes a case of obstinate postpartum vaginovesical fistula cured by operation, but followed by incontinence of urine, persisting for many years. This resisted several interferences, including three torsions of the urethra, following the last of which came gangrene of most of the canal. The patient then came under the author's treatment, which consisted in other attempts to twist the stump of the urethra and neck of the bladder, and finally to cause a fold in the neck. Temporary improvement and then relapse occurred. The patient went home to rest in a condition of incessant dribbling while sitting, standing, or

[1] Centralbl. f. Gynäk., Dec. 1, 1900.

walking, and continence for only a short time and small amount while recumbent. After a while she returned for further treatment, which was begun notwithstanding an acute gonorrheal kolpitis. July 19, 1900, under cocain, paraffin was injected in a ring about the bladder-end of the urethral remnant, in the form of unguentum paraffinæ, 3.50 grams. Irrigation was retained. After a few hours catheterizing was necessary, and again the next day. After 2 days there was continence in the recumbent, but dribbling in the erect position of the trunk. July 26th, under cocain, 2.50 cc. of the same preparation was injected, reinforcing the former and making a thick ring, which was palpable from the vagina, apparent in the vestibule about the neck of the bladder and encroaching upon the lumen of the viscus much as a slightly enlarged prostate does in the male. During the next 24 or 36 hours the patient was harassed by violent urinary tenesmus, recurring every 5 or 10 minutes. Whether this paraffin ring or the complicating gonorrhea was the cause was never determined definitely, but the condition soon improved, and July 31st, at discharge, the patient remained dry in the erect position and in walking for 1 to 1½ hours. This control increased to 5 hours during the next 3 weeks while still under treatment for the gonorrhea. Meanwhile the paraffin mass had not in the least altered. October 25th, the patient described her condition as much better; walking about she could hold her water for from 4 to 6 hours, and for 10 hours while resting. While active, the bladder would contain about 3.5 deciliters. Micturition was voluntary, but intermittent, a good stream being interrupted at short intervals by brief dribblings until the bladder was empty. This seemed to depend upon respiration. [Whether such paraffin injections will be generally serviceable remains to be proved, but the condition of this woman 3 months after treatment indicates that it has possibilities worthy of trial.]

Irritable Bladder in Women.—Bierhoff[1] considers that in females "irritable bladder," or vesical hyperesthesia, rarely occurs as a true neurosis. It is generally a symptom of some change in the vesical mucous membrane. In 57 cases of his own, there were only 4 which could be limited to "nervous conditions." The remainder were principally composed of evident cystitis, pericystitis, hyperemia, or uterine malpositions. The symptoms of the condition are frequency of urination and a varying degree of pain or tenesmus. [If a woman urinates more than 5 times during the day, or is awakened during the night by a desire to urinate, her micturition becomes abnormal.] Pain is a varying symptom, dependent upon the nervous disposition of the patient, and in its estimation such must be taken into account. In diagnosis the vulva, urethra, and genital organs should have equal consideration with the bladder. Bierhoff prefers the Nitze-Oberlander endoscope for purposes of examination. He places it in a 2% solution of holzin (60% solution of formalin in alcohol) for 5 minutes. The bladder is thoroughly irrigated with a 1% solution of boric acid. Hyperemia appears as an abnormal reddening of the mucous membrane,

[1] Am. Jour. Med. Sci., Dec., 1900.

with dilation of the minute blood-vessels; it is most frequent at the fundus, extending from the ureteral orifices to the posterior part of the urethra. Vesical varices are a frequent cause of increased bladder sensibility. They accompany pregnancy, but in this state it is the larger veins that are dilated. As regards **cystitis,** additionally to the ordinary varieties, attention is drawn to a distinct "cystitis papillomatosa," occurring at the fundus, and due to hypertrophy of the papillas. Pericystitis follows pelvic inflammation and results in distortions of the bladder, forming saccules in which the urine stagnates. Cystocele, uterine displacements, carcinoma, calculi, and tuberculosis are among other conditions in which the irritability occurs. The prognosis is fair, except when the parent causes are well marked. **Treatment:** All pelvic changes should be treated, and regular evacuations from the bowel induced, preferably by enemas, as cathartics tend to increase the vesical tenesmus. Urethral caruncles should be removed, and fissures cauterized with $AgNO_3$. Catarrhal urethritis yields to the direct applications of astringent solutions. Hyperemia should be treated locally by irrigations of a 1 % solution of boric acid, followed by instillation of $\frac{1}{4}$ % to $\frac{1}{2}$ % $AgNO_3$ solution. If urinary bacteria are present, urotropin is the most useful drug. In pericystitis the adhesions may be gradually stretched by bladder-massage. Boric acid solution is slowly injected into the bladder until the patient feels a sensation of pain or tenesmus, when it is stopped for a few moments. The symptoms soon pass and then a further quantity is passed in. This distends the bladder fully and is allowed to remain there three minutes. The sittings are repeated every second day. The method has given excellent results. In the "Jacobi Festschrift," page 148, Bierhoff recommends endoscopic examination in children for enuresis and irritable bladder, and applies through the tube local treatment or irrigation and instillation. When the child is very young he advises hot sitz-baths once or twice a day, restriction of fluids in the evening, combined with a light meal at night, no pillow allowed for the head, and, when possible, the foot of the bed raised.

Edema of the Bladder Due to Stricture.—Kolischer[1] believes that strictures of the urethra in the female may be of congenital origin, being independent of any previous inflammatory process. They are caused by localized deposits of fibrous elastic tissue and are only recognized clinically by using olive-pointed bougies. When seen through the endoscope they appear as semicircular or circular ridges around the canal. While in some cases they give rise to no symptoms, in others the patient complains of constant irritation and tenesmus, while the urine contains numerous epithelial cells and detritus. Cystoscopic examination of the bladder in these cases shows edema of the mucous membrane at the neck of the bladder, which may involve the mucosa generally. Instead of presenting the usual deep red color, it is pale and swollen, resembling wet absorbent cotton. In many instances, through diminished vitality of the mucosa or actual infection, there may be an actual loss of substance over the edematous area, which in time results in the formation of an ulcer.

[1] Centralbl. f. Gynäk., 1900, No. 17.

Treatment is useless as long as the presence of the stricture—the true cause of the edema—is recognized. Internal urethrotomy followed by applications of iodoform to the ulcer effects a cure. In conclusion, the writer insists upon the importance of a thorough cystoscopic examination in young women with obstinate vesical symptoms, even though the usual etiologic factors—gonorrhea and puerperal lesions—are absent.

The Intravesical Evidences of Perivesical Inflammatory Processes in the Female.—F. Bierhoff[1] remarks that in cases of perivesical inflammation the cystoscopic picture varies according to whether the pelvic inflammatory process is a recent or an old one, and whether it has extended to and involved the bladder-wall, or only the adjacent tissues. If the process is recent, the exudate encroaches to a greater or less extent upon the bladder, the distensibility of which is, to a corresponding degree, impaired. If the exudate is unilateral, the excursions of the cystoscope are limited on the affected side, while normally free on the unaffected one. Similarly, if it occupies Douglas's culdesac, the uterus tends to be somewhat displaced forward, and the excursions are limited toward the posterior wall of the bladder. In all these cases, if the amount of exudation is marked, the bladder-wall will be seen to bulge inward over the site of the exudate. When an inflammatory process in the tissues adjacent to the bladder extends to and involves the wall of this viscus (frequently an accompaniment of salpingitis and perisalpingitis), we at times meet with "œdema bullosum." When the process is an old one, and the exudate has gone on to organization, the cystoscopic picture is an entirely different one. In the same way that displacements of the uterus and adnexa may be caused by the traction of the fibrous strands, resulting from the organization and contraction of an inflammatory exudate, we may have the bladder affected by these strands pulling upon parts of its wall. But, while in the case of the uterus and adnexa we get displacements, in the case of the bladder there is distortion. The most characteristic appearance, however, in these cases, is the presence, over parts of the bladder-wall, of sharp scar-like formations, which rise, to a greater or less extent, above the surrounding wall, have a yellowish-white color, and tend to fimbriate at the ends. The parts usually affected are the lower lateral and the upper posterior and posterolateral portions of the bladder. Two conditions are to be differentiated from the "pericystitic strands." These are columnar bladder and the contractions of the muscular coat of the bladder. Of these, the former is found only when some obstruction to the outflow of urine has existed for some time, and has led, as a consequence, to hypertrophy of the bladder-muscle. The obstruction may be mechanical (foreign body, marked prolapse, tumors) or spastic, as in the early stage of tabes. When this condition is present, the whole of the bladder-wall is involved in the hypertrophic process. It will be seen that the wall is crossed by a network of projections above the surface. These projections appear to anastomose, or to cross each other freely. They are of rounded contour.

[1] Med. News, Mar. 9, 1901.

The "pericystitic strands" are, as before stated, limited to certain circumscribed portions of the bladder-wall, rise, as a rule, less markedly above the surface, tend to have fimbriated extremities, and are of sharp contour. The contractions of the bladder-muscle are easily excluded, for, when they occur, we see the muscle-bundles appear and then disappear, over the entire field of vision, with the contraction and relaxation of the bladder-wall. The prognosis of the recent condition is that of the exudative inflammatory processes themselves. The later changes are of interest chiefly because they may exert an influence as complicating factors in disturbances of urination, especially as an accompaniment, or additional cause, of vesical hyperesthesia. Treatment of the recent processes usually results in the disappearance of the vesical changes, although further involvement, with perforation of the pelvic abscesses into the bladder-cavity, may occur. In the older cases, when the aforementioned strands are present, the prognosis, as regards the disappearance of urinary symptoms, is excellent. With regard to the full resorption of the strands, it must still remain an open question. The treatment of the recent cases resolves itself into measures to relieve the underlying cause, and later to promote resorption of the inflammatory exudation. In those in which the strands are present it consists of treating, first, any inflammatory vesical changes, and, later, gradual distention of the bladder. The last-mentioned procedure is employed as follows: By means of a graduated syringe, a quantity of some indifferent fluid (boiled water or boric-acid solution) is gently injected into the bladder, to the extent of its tolerance, and allowed to remain there some minutes. It is then allowed to flow off until but a small quantity remains. On the following days gradually-increasing quantities are similarly injected, until, after a length of time which varies according to the extent of involvement and the elasticity of the strands, the bladder tolerates the normal amount of fluid. In this way we are enabled to remove entirely all vesical irritability, and, in several instances, to bring about a disappearance of the strands themselves.

Ureteral Implantation.—An editorial in the "Journal of the American Medical Association" remarks that many pathologic conditions offer indications for implantation of the ureters into the rectum or colon. As examples may be mentioned ureterovaginal fistula, large vesicovaginal fistula, stricture and obliteration of the ureters under conditions preventing reinsertion of the ureter into the bladder, tuberculosis and carcinoma of the bladder, and atrophy of the bladder. In these and other conditions new routes for the discharge of the urine are desirable. Turning the urine into the rectum is not altogether against all physiologic precedent. In birds, for instance, there is a common route of exit for both urine and feces, and cases have been recorded in which the ureters emptied into the rectum in human beings, by virtue of the persistence of an early embryonic condition. Richardson's patient lived 17 years, and without urinary incontinence. We have also learned that the rectum may acquire tolerance of the presence of urine. It is the occurrence of ascending infection of the urinary tract that constitutes the

most serious obstacle to ureterocolostomy. The only method that so far successfully overcomes this danger is Maydl's, whereby the part of the urinary bladder containing the ureteral orifices is properly fixed in the intestinal wall. The preservation of the normal ureteral openings is the reason why Maydl's method is superior to all other procedures yet devised. In all other operations, even when the ureters are inserted obliquely and the orifices guarded by an ingeniously constructed valve of rectal mucous membrane, there is, sooner or later, retraction, atrophy of the valve, and infection. [Inasmuch as Maydl's method of ureteral transplantation is not always applicable, a method of creating an orifice in ureterocolostomy that does not retract is a desideratum which surgical ingenuity has yet to furnish.]

Nephrorrhaphy.—Noble [1] reports his experience in 42 patients, one having the operation on each side at separate times. Two patients died, one having chronic interstitial nephritis, but such pain from the displacement that it must be treated, and one from pulmonary embolism or some analogous condition. No kidney has become loose again, and the greatest movement is an inch in a case in which the wound suppurated and the sutures had to be removed. Twenty-nine are known to be relieved of their symptoms, 5 improved but not well, 4 are no better, and in 2 the result is not known. The symptoms are neurasthenic, and it is not easy to decide that they are reflex from the movable kidney, and that this is not merely coincident. For the diagnosis it is insisted that the patient be examined standing, leaning forward with the hands resting on a table, the waistbands all loose but supported, and the respiration regular. In the operation the capsule of the kidney is separated, and three silkworm-gut sutures passed through it and the lumbar muscles. The lumbar muscles are closed by chromic gut sutures, and the other layers in sequence.

MENSTRUATION AND ITS DISORDERS.

Menstruation and the Proestrum.—An editorial [2] remarks that menstruation is a physiologic riddle not yet read, nor indeed likely to be read for some little time. Nevertheless, contributions such as that by Heape [3] will do much toward the ultimate solution of the problem, hitherto so baffling. The understanding of the structure of the human placenta made little progress until investigators began to turn their attention to the characters of that organ in the other mammals, to construct the comparative anatomy of the placenta. Much is still to be learned regarding, for instance, the mode of vascularization of the placenta in the early and in the later months of uterogestation, and the possibility of vitelline as well as allantoidal vessels taking part therein; but it must be freely admitted that noteworthy advances have been made. Heape has attempted to do something of the same kind for menstruation and the changes in the menstruating uterus by a study of

[1] Jour. Am. Med. Assoc., 1900. [2] Brit. Med. Jour., Mar. 9, 1901.
[3] Quart. Jour. Microscop. Sci., XLIV, Nov., 1900.

the comparative physiology of the sexual season in mammals. He begins, wisely, with a revision of the current terminology; for in this confusion reigns, the same names having been applied to processes in the male and female which are quite distinct, and different designations having been given to the same phenomenon. The "reproductive period" is the whole period of the life of a mammal (male or female) during which its generative organs are capable of the reproductive function; the "breeding season" is the whole of that consecutive period during which any male or female mammal is concerned in the production of young, and it does not include (for the female) the nursing period, while it does include the "sexual season" and gestation. The "sexual season" is, for both male and female mammals, the particular time or times of the year during which their sexual organs exhibit special activity—it may be one or more periods, long or short, interrupted or not by gestation (in the female). With the sexual season in male mammals we are not here specially concerned; but Heape regards it as synonymous with "rutting season," a term which ought not to be employed at all in speaking of the phenomena in the female. Some male mammals (for example, the stag) have a localized time (rutting season) during which they are capable of inseminating; others (for example, the dog) are sexually capable all the year round, and therefore do not rut. Domesticated mammals and wild mammals in a captive state have more frequent but less violent sexual seasons. The female sexual season and its modifications are of great importance in enabling us to obtain a correct notion of menstruation. It differs much with and without the occurrence of gestation; but it is chiefly with the phenomena in the absence of the male, or when impregnation does not take place, that Heape's contribution is concerned. The sexual season consists of four consecutive periods. There is the "proestrum" (the "coming-in season"), a period of time varying in extent from one to several days, and characterized by more or less congestive and hypertrophic changes in the internal and external generative organs and by a proestrous discharge from the genitals, consisting most usually of mucus, but sometimes of blood also. The proestrum is succeeded by the "estrus," the climax of the process, the special period (for the female) of desire, the time during which fruitful coitus is possible. It normally follows the proestrum, but in some instances occurs in the middle of pregnancy ("abnormal estrus"). During estrus the wave of vascular disturbance which has in the proestrum invaded first the external and then the internal generative organs sweeps back again to the external parts. Estrus is followed by the "metestrum," during which the activity of the generative organs is gradually subsiding; and this in its turn by the "anestrum" or "anestrous period," the resting-time during which the organs lie fallow, a period varying from 2 to 11 months. These four periods constitute the "anestrous cycle," and mammals such as the wolf, which have one such cycle in the year, or the bitch, which has two or three such cycles, are called "monestrous" mammals. But there is another type of sexual season, the "diestrous." In it proestrum is followed by

estrus, that by metestrum, and that by a short resting-time, "diestrum," and then the cycle begins over again—proestrum, estrus, metestrum, and then anestrum (long rest), or even perhaps diestrum, and the whole cycle once more. The mare, for instance, has at a certain time of the year a series of diestrous cycles which together constitute her sexual season; she is therefore a "polyestrous" mammal. In the human subject there occurs a continuous series of diestrous cycles, polyestrous therefore, so that she has a sexual season during the whole of her reproductive period (in the absence of gestation). It is believed that some women may have an anestrous period; for example, the Esquimaux, who menstruate every 3 months; if this be so, it may indicate the persistence of an ancestral habit. When conception takes place, the periods of the proestrus and the estrus are followed by gestation and parturition, and then the mammal passes through what may remain of the anestrous period, or, without a time of rest, may be at once in another estrus and conception again occur. The periodicity and duration of the sexual season and of its various parts are no doubt influenced by climatic, individual, and maternal conditions, and into the evidence bearing upon these points Heape goes very fully, as also into the question of whether the monestrous type is a decentralized polyestrum, or the polyestrous concentration of several monestrous sexual seasons. Another interesting matter which is touched upon is the cause or origin of the sexual season; it is probably the result of a stimulus, and that stimulus, it is likely, comes from the alimentary canal; at any rate, the "flushing" (special feeding) of ewes hastens the advent of the sexual season in them. The most important question, however, is the relation of human menstruation to the cycle of events in the sexual season of other mammals. Heape boldly identifies it with the proestrum. In both menstruation and the proestrum there is congestion, in both there is recurrence, and the homology is to be expected from the standpoint of phylogeny. There is a difficulty in the nature of the discharge, which is blood in the primates, not even blood-stained in most mammals. But this can be explained, for there exist all the gradations between simple mucus with some epithelial cells and blood with some of the uterine stroma. Further, in some instances there is an extravasation of blood into the cavity of the uterus, but either this blood is absorbed *in situ* or is expelled later as clot. So the proestrum (so-called "heat") of the lower mammals is homologically the menstruation of the primates. In all these conclusions it will have been observed that ovulation is made to play a subsidiary part. The proestrum is a sign rather of sexual than of reproductive power, for it is not necessarily accompanied by ovulation, neither is ovulation necessarily coincident with the estrum. Of course, both the estrum and ovulation are due to some stimulating influence, but they are not coincident and are not necessarily induced by the same means nor at the same time; they are separate functions, "possibly closely associated, but also possibly widely divergent." Heape, then, does not agree with Beard and others who look upon the ovary as the governing power of the breeding function, and closes his article with

the suggestion of the recurrent presence in the blood of "anestrous toxin."

The Influence of Climate upon Menstruation.—W. J. H. Hepworth [1] records an interesting case of amenorrhea in which the patient found that a visit to the country was sufficient to bring on her periods. With such certainty did this occur that she formed the habit of going out of town for a couple of days in each month, when she at once became unwell, although if she remained in London the period invariably failed to appear. [A considerable amount of study has been devoted to the influence of climate upon menstruation. There can be little doubt but that it plays an important part in determining the age at which puberty occurs, but is only one—perhaps, however, the most important—of many factors influencing the result. Marc d'Espine, who made some special investigations upon the subject, came to the conclusion that the onset of puberty varies directly with the latitudes, the tendency being for the first menstruation to occur at an earlier age the nearer the equator is approached. The climate of a country plays, however, a more important part than its latitude, and the variations observed in the age of puberty in different countries bear a close relationship to the average temperature of the air in those countries. Krieger has drawn up an elaborate table showing the exact age at which puberty occurs in different latitudes, and from this it can be seen that while the average age in Swedish Lapland is 18 years, in London it is 14 years and 9 months, and in Sierra Leone 10 years. The matter has been almost entirely considered from the point of view of the time of the occurrence of the first menstruation, but the influence of a climate in producing an early or late puberty may well be regarded as indicating its probable effect upon the occurrence or nonoccurrence of menstruation after puberty has been established. That climate plays any part at all in the matter has, however, been denied by many authors, who hold that the question is rather one of race and nationality. In support of this they bring forward the fact that women of different nationalities inhabiting the same country under similar climatic conditions do not begin to menstruate at the same age. In Hungary, for instance, Joachim has shown that the average age at which puberty occurs among the Magyars is from 15 to 16 years, among the Slavs from 16 to 17 years. This fact does not, however, show that the influence of climate is of no importance. To affirm this it would be necessary to prove that women of different nationalities inhabiting the same country under similar climatic conditions for very long periods of years had continued throughout to menstruate for the first time at the same average age. In discussing the onset of puberty many other conditions remain to be considered, such as race, nationality, mode of life, station in life, the early excitation of the sexual feelings, and the question of nutrition and clothing.] Hepworth's case, however, proves that change of climate alone may have a marked effect upon menstruation. Nor is this surprising when we consider that the whole question

[1] Lancet, Nov. 10, 1900.

is largely one of nutrition. Heat and sunlight are among the most important factors of nutrition, and the early onset of menstruation among the inhabitants of the countries near the equator is no doubt in part due to the great heat and the large amount of sunlight to which they are exposed.

The Menstrual Function and the Rut of Animals.—A. Gautier [1] traces a relationship between the functions of the genital organs, those of the thyroid gland, and the growth of the appendages of the skin, namely hair and nails. His attention was attracted to the subject by the observation that patients, when taking arsenic, menstruate more frequently than at other times, that their skin improves in condition, and that their hair increases in length and thickness. Since arsenic and iodin are assimilated by the thyroid, and excreted by the epidermis and its appendages, it occurred to Gautier that it is upon the utilization and elimination of these substances that the above-mentioned relationship is based, and his experiments have confirmed him in this opinion. He has shown that the normal blood of man and of animals contains no arsenic and very little iodin, while menstrual blood contains 28 milligrams of arsenic per kilogram, and 4½ times more iodin than normal blood. A human thyroid contains about 15 milligrams of arsenic, so that, allowing for a blood-loss of 400 to 500 grams per day during menstruation, the total blood lost would contain 12 to 14 milligrams of arsenic, or nearly as much arsenic as the thyroid of the patient contained before menstruation. Thus arsenic and iodin are excreted every month by woman, and menstruation finds its *raison d'être* in a removal of these substances from the thyroid and perhaps also, in less degree, from the skin. Normally the nucleoproteids and iodized bodies of the thyroid go to nourish the skin, and especially the hair-bulbs and the nail-beds. The arsenic and iodin thus used are eliminated by the shedding of hair and nails, and by the desquamation of the general surface of the epidermis. In woman there is an excessive production of these bodies, which is eliminated periodically in the menstrual blood, unless conception occurs, in which case the excess is used up in the construction of the fetus, in whose rapid growth much phosphorus, arsenic, and iodin are consumed. We are aware that the thyroid gland excites and regulates growth, that it influences the nutrition of the skin, and that it is in relation with the development and function of the reproductive organs. Its atrophy in the cretin coincides with arrest of development, myxedema, and infantilism of the sexual organs. On the other hand, the thyroid develops rapidly in the pregnant woman, and in certain females it hypertrophies some days before menstruation. Hofmeister has observed atrophy of the sexual organs after removal of the thyroid, and conversely it is stated that the administration of thyroid substance has been followed by renewal of growth in an infantile uterus. In a word, all the organs rich in nucleins, especially those in which arsenic and iodin occur together, are favorably influenced by the administration of thyroid substance. It is mainly by the appendages

[1] La Presse Méd., Sept. 8, 1900.

of the skin and by the menstrual blood that arsenic and iodin are eliminated by the female human subject. It may be asked, however, how these substances are dealt with by the male subjects, and by female animals which do not menstruate. The author answers this question by pointing out that warm-blooded animals of both sexes are covered with hairs or feathers, which grow as a rule before the breeding season, and are shed to a considerable extent when the period of sexual activity is passed. Thus, the supply of arsenic and iodin is used during the winter in growing fur, feathers, horns, etc. When these have reached their full growth the supply of nucleoproteids is diverted to the sexual organs, and breeding commences. The skin is thus deprived of the essentials of luxuriant growth, the hair falls out, the horns fall off, and the feathers drop out. The human male is not, as a rule, covered with hair; but at the same time he is more hirsute than the female. The hair of his head and beard grows, and our author maintains his epidermal desquamation is more rapid than that of the smoother skin of the female, whose hair does not grow much after puberty is reached. The extra growth of hair in the male human subject is thus said to eliminate as much arsenic as is lost in the menstrual blood by the female. In other words, the girl only begins to menstruate when her hair stops growing, whilst, on the other hand, it is just at the same period of life that the boy's beard begins to grow. Among hairy human races, in whom, as in monkeys, arsenical nucleins are largely used up in the production of hair, menstruation and the corresponding periods of sexual appetite would be expected to appear at longer intervals than in hairless humanity. The author has ascertained by inquiry from anthropologists that this is actually the case. He also finds that cutting off the hair of females, as is done in some religious institutions, provides a fresh outlet for arsenical products, and thus tends to check the menstrual function. The author illustrates his views by observations upon certain lower animals, notably many male birds, whose feathers grow to brilliance before the breeding season, and are shed like a wedding garment at its close. Other birds grow appendages on their beaks, which fall off after the breeding season. Among certain Urodela a horny crest, rich in arsenic, decorates the tail of the male animal, and is reabsorbed during and after the reproductive period of the year. Lastly, the author mentions the various affections of the skin which are common during pregnancy as evidence of the strain upon the production of arsenical proteids, which is caused by gestation. Myxedema, he finds, is a disease most common among multiparas, who have time after time drawn upon their reserves of thyroid-produced substances.

Obesity as a Cause of Sterility.—Paoli [1] calls attention to the fact that obesity is often associated with malformations in the genital tract, nervous and vascular disturbances, and errors in secretion. Hence results painful, scanty, and irregular menstruation, infrequent conception, and, if this occurs, abortion is common. Sterility in fat women has been variously attributed to pelvic lesions and arthritic troubles.

[1] La Gynécologie, Feb. 15, 1900.

Treatment of sterility in such subjects should be reserved for cases in which disturbances of secretion are marked. If congenital malformations exist, the prognosis is hopeless. [This writer has referred rather vaguely to that interesting class of cases in which a rapid increase of adipose seems to be directly associated with suspension of the ovarian functions. That this condition is not due to true atrophy is proved by the fact that menstruation may return and even conception occur after the excessive weight has been reduced by rigid diet and exercise. This intimate relation between the ovarian function and metabolism would seem to furnish an argument in favor of the so-called internal secretion of the ovary.]

Menorrhagia and Metrorrhagia.—J. I. Parsons [1] says that the ordinary causes of this condition, such as tumors, cancer, and diseased appendages, are well understood, but he especially directs attention to that class of cases, by no means infrequent, in which no obvious cause for the hemorrhage can be found. In these cases, if the curet is used and the endometrium is found to be thickened, cureting is commonly of service. If the endometrium is normal, it will be found that the operation often aggravates the hemorrhage. In such cases he has been able to stop the hemorrhage permanently by the use of the constant current. In the class of cases with a thickened endometrium which are relieved by cureting there is an excessive glandular proliferation. In the second class of cases, in which the bleeding persists after cureting, there is a proliferation of connective tissue and the glands are increased in number. This is sometimes known as an interstitial endometritis. Siredy [2] calls attention to cases of metrorrhagia in young girls in whom no local cause can be discovered to account for the phenomenon. The writer believes that while heredity may play some part, the natural tendency is aided by overexertion, especially by horseback-riding, cycling, dancing, etc., which stimulate the pelvic circulation. As regards treatment, hot vaginal douches and tampons are rarely necessary, and should not be resorted to except in extreme cases. Prolonged hot rectal irrigation with the double current tube is a useful means of local treatment. Absolute rest in bed throughout the entire period should be maintained. Long walks, dancing, the use of the bicycle and sewing-machine, horseback-riding, or long standing must be interdicted, and at other times should be permitted only in moderation. Careful attention to the general health, regulation of diet, and the overcoming of inherited defects are important adjuvants. Hydrotherapy, especially the cold douche, is a valuable means of diminishing pelvic congestion. Life in the country, with the absence of all exciting social elements, is preferable.

In the treatment of uterine hemorrhage Ostermann [3] has employed the method introduced by Labadie-Lagrave in 30 cases, with good results. Equal parts of antipyrin and salol are melted together in a test-tube and brought to the boiling-point, the resulting fluid being of the

[1] Lancet, Feb. 23, 1901. [2] Rev. Prat. d'Obstét. et de Gynéc., 1900, No. 3.
[3] Deut. med. Woch., Mar. 20 and Apr. 5, 1900.

consistence of thin syrup. A bivalve speculum is introduced, and the cervical and uterine cavities are thoroughly freed from discharge by dry cotton wool on a Playfair's probe. Another probe, also provided with absorbent wool, is then dipped into the hot antipyrin-salol fluid, and the uterine cavity is swabbed out with it 3 or 4 times. Labadie-Lagrave, however, uses the fluid after it has cooled down. If the direction of the uterine axis is first determined by the sound, it is unnecessary to employ vulsellum-forceps to bring down the cervix. These directions apply only to cases in which it is possible to adopt the treatment in the intervals of flooding, the best time being shortly after a period. If the application be made during hemorrhage, an attempt to cleanse the uterine cavity only aggravates it. It is better in these cases to introduce the fluid at once, after simply cleansing the portio cervicalis. Most of the writer's cases of hemorrhage depended on endometritis with some complication, such as inflammation of the appendages, pelvic peritonitis, old hematocele, and retroflexion of the uterus, but others were due to subinvolution after abortion or labor, or to the menopause. In about one-fourth of the cases the uterus had been cureted previously, but the antipyrin-salol fluid acts well in cases of fungous endometritis without any previous operative treatment. When applied during flooding the hemorrhage sometimes ceases at once and does not recur; in other cases several applications may be required. The treatment is not painful unless the fluid is used very hot. Contraindications are submucous myomas and malignant growths. [The simplicity of the method is a great advantage in the case of anemic and nervous women, where anything resembling an operation, such as cureting or atmocausis, is refused. The active ingredient of the liquid is almost certainly the antipyrin, salol being added chiefly to lower the high melting-point of antipyrin and to render the melted mixture more fluid. How it acts as a hemostatic is not known, for its caustic power, even when hot, is but slight.] Gerstenberg [1] reports a series of cases in which he applied concentrated formal within the uterine cavity. A 40% solution of formaldehyd was introduced on an applicator without causing pain or other bad effects. The patient was kept in bed for 2 days. It may be necessary to repeat it once or twice. This treatment is especially useful in climacteric hemorrhages, or when curetment is contraindicated.

Dysmenorrhea.—*The Relation between Dysmenorrhea and Appendicitis.*—A MacLaren [2] says that inflammatory diseases of the ovaries and the Fallopian tubes and adhesive deformities of the uterus are at times the causes of dysmenorrhea. The close relation which often exists between the vermiform appendix and the right tube accounts for the frequency with which inflammation in one structure affects the other. In 100 of Kelly's operations on tubes and ovaries the appendix was found adherent in 27 cases, and in 7 it required removal. Robb also states that purulent salpingitis is at times due to an extension of an infection from a diseased appendix. The writer's experience is that out of 58 cases

[1] Centralbl. f. Gynäk., 1900, No. 34.
[2] Am. Gynec. and Obstet. Jour., July, 1900.

in which inflammatory appendages have had to be removed, the appendix has shown enough evidence of disease to justify removal in 20 cases. In 9 of these cases the adhesions between the appendix and the right appendage have been very intimate. Aside from well-recognized cases of appendicitis, there is an appendiceal colic which recurs at each menstrual period. These mild inflammatory attacks, which are commonly described by the patient as taking cold, are probably mild attacks of appendicitis. It is perhaps not a true attack of the disease, but an appendiceal colic. The only way to relieve such cases is to remove the appendix, and it has occurred to the author that this may be the explanation of failure to relieve some few cases of dysmenorrhea by ordinary treatment. In the treatment of 10 cases, B. M. Sircar [1] recommends *olut kombool*, the fresh, viscid sap from the *Abroma Augustum*, of the natural order *Bythneracea*, which is a large, spreading shrub found in the nontropical parts of India. The medicine (amount not stated) is used for 2 days before, during the flow, and for 2 days after the cessation of the menses. A single administration during the menses generally cures the disease and brings on conception in young married women. The remedy is efficacious in both the congestive and neuralgic forms of dysmenorrhea, but it has no action upon the mechanical variety nor on organic lesions of the uterus. Forty years' experience with the remedy is the basis of the author's confidence.

The Menopause.—*The Dietetic Treatment of the Change of Life.*—[Doubtless much may be done to mitigate the ailments incident to the menopause without resorting to the use of drugs.] Kisch [2] thinks the dietetic treatment of importance. Overfeeding, he says, should be avoided. The diet should be of a mixed character, and coffee, tea, and alcoholic drinks should be eschewed. The free drinking of water is highly to be recommended. Fattening foods must not be allowed if there is a tendency to obesity. In cases in which menstruation stops suddenly or at a comparatively early age, and the complaints of the climacteric are at the same time aggravated, a systematic course of milk is very useful. Herz [3] reports excellent results in a number of cases of plethora at the climacteric. The intervals between the bleedings were never less than 3 months. For the heats and flushings due to the menopause Gottschalk [4] recommends an efficacious and simple measure, which consists in taking every evening regularly a full hot bath at a temperature of 104° F., lasting 20 minutes. After a few baths great improvement is noticeable, and after some 26 to 28 a cure is obtained.

UTERINE INFLAMMATION.

Acute Senile Endometritis.—L. H. Dunning,[5] from a study of 2 cases of this disease, summarizes as follows: The characteristic pathologic features of the inflammation are (*a*) a thickened endometrium, the

[1] Indian Med. Gaz., No. 5, 1900, p. 172.
[2] Zeit. f. diätet. u. physikal. Therap., III, 8; Centralbl. f. innere Med., June 30.
[3] Centralbl. f. Gynäk., Sept. 29, 1900. [4] N. Y. Med. Jour., Sept. 1, 1900.
[5] Jour. Am. Med. Assoc., Nov. 3, 1900.

free surface of which is devoid of its epithelial layer; (*b*) increased vascularity with a peculiar arrangement of the small blood-vessels; (*c*) small round-cell infiltration; (*d*) diminished glandular elements; while a few glands may be distinctly seen in many of them, their epithelium is desquamating and their lumen filled with granular débris; they may be said to be functionless glands; (*e*) degeneration of the coats of the arteries of the muscular layer of the organ; (*f*) in not one section examined from various parts of the organ could there be found any connective tissue. The mucosa of both the cervix and body is involved in the inflammation, but it is more marked in both cases in the body of the uterus. The small round-cell infiltration extends into the upper muscular tissue, though the inflammation is more marked in the mucosa. In both cases one uterine appendage was diseased; in one, the ovary was cystic; in the other, one ovary was cystic and the Fallopian tube inflamed. In this case there were slight recent peritoneal adhesions. The microscopic appearance in these cases bears but slight resemblance to that found in cases of interstitial endometritis. In one case the acute inflammation seems to have developed without any preceding chronic inflammation. In the other case the acute attack may have been an acute exacerbation of a chronic inflammation. In one case there was a marked retroversion of the uterus, in the other the uterus was in normal position, and in neither case was there marked stenosis of the internal os; yet there was a considerable accumulation of fluid within the uterine cavity. The presence of diseased appendages in both cases and of pelvic peritonitis (mild) in one seems to indicate that the inflammation is prone to extend beyond the limits of the uterus, and if such extension is demonstrable by combined examination, an extirpation of the uterus and appendages is indicated. Lorain [1] calls attention to the importance of making an exact diagnosis in this condition, since hemorrhage is a frequent symptom. The treatment consists in dilation of the cervical canal and the application of carbolic acid, iodin, or ichthyol two or three times weekly, followed by the insertion of a strip of gauze. This will usually be successful in 3 or 4 weeks.

Treatment of Endometritis.—In the treatment of this condition J. Stirton [2] advocates the silver salts, particularly silver nitrate deprived to an extent of its water of crystallization and somewhat diluted by the addition of some other nitrate, preferably potash, in the attempt to restore healthy action to the diseased uterine mucous membrane. This combination is not caustic in its destructive effect upon the mucosa, being nothing more than a rapid oxidizer; the hemorrhage which sometimes ensues 3 or 4 days after the application he considers distinctly beneficial. He deprecates the generally growing use of the curet instead of the local applications at one time so popular, on the ground that this is the employment of mechanical means used in the dark on a surface whose pathologic condition is comparatively an unknown quantity in its entire extent. There is great risk of scraping off a thicker layer than would be beneficial, thus doing serious mischief to the physiologic action

[1] Frauenarzt, Jan. 19, 1900. [2] Glasgow Med. Jour., June, 1900.

of the organ during pregnancy. He has often seen abortions which were clearly referable to contractions after cicatrization when excessive cureting has been done. J. G. Roberts [1] recommends the use of injections of iodoform-glycerin emulsion in cases of purulent endometritis.

Intrauterine Douching.—Talley [2] advocates irrigation in this condition, the fluid used being hot alkaline water. He uses a narrow cannula provided with two wires, to allow the return flow of the irrigating fluid, and permit the uterine canal to be washed to its entire extent. The cannula is curved at its end to provide for easy introduction, perforated in every direction at its extremity, and of such a size that it will easily pass through a No. 15 French catheter scale. It is attached to a fountain syringe of at least 2 quarts capacity, and a thermometer should be used to determine the temperature of the water. He has also used a speculum with a funnel through which the return fluid may pass without danger of wetting the clothing or bed. The solution used is water with 1 dram of sodium bicarbonate to a quart, and enough carbolic acid to render it mildly aseptic. He never has the temperature above 123° F., and usually somewhat less—about 110° F. at the beginning, and gradually increases it. It is important that the irrigation should be carried on until its secondary vasomotor effects are insured. Cases suitable for this form of treatment are those only in which the cervical canal is patulous.

The Curet.—E. W. Peery [3] recommends a new form of curet which is to be worn on the finger, and may be used in those cases in which the cervical canal is already open, or after its dilation (Fig. 89). While the instrument is especially useful in cases of incomplete and induced abortion, it may also be used in cases of fungous and decidual endometritis, in cases of multiple polypi of small size, and of polypi arising from placental tissue; in obstetric cases to remove portions of placenta, and in the puerperal state to curet the uterine cavity when there are symptoms demanding such a procedure. The advantages claimed for this little instrument are these: (1) As the blade is broad and round, and the cutting edge semisharp; as the sense of touch is better; and as the finger is within the uterine cavity gauging its depth, there is not so much danger of injuring the parts. (2) Being placed on the finger, it enables the operator to reach easily the fundus uteri, and the retained portions or other abnormal tissues hanging from this or other parts of

Fig. 89.—Peery's finger curet.

[1] Phila. Med. Jour., Mar. 16, 1901. [2] Pacific Med. Jour., May, 1901.
[3] Med. Rec., Sept. 8, 1900.

the uterine walls are easily scraped away. (3) By its use the finger is lengthened so that the fundus can be reached in most cases by introducing two fingers, and in every case it can be reached easily by inserting the four fingers up to or a little above the metacarpophalangeal joints, so that the whole hand need not be introduced; consequently there is not so much stretching of the vaginal walls, and therefore less pain. (4) It enables the physician to do the work in half the time required without it, thus lessening the danger of prolonged hemorrhage and the suffering of the patient. (5) By its use portions of decidua which may adhere high up in one or the other cornu can be removed more easily than by any other means at our command. (6) The finger-nail which must enter the cavity of the womb is practically sealed, doing away with another possible source of infection. (7) It not only separates the adherent decidua or placenta easily, quickly, and safely, but the cup-like portion makes it easy to withdraw pieces from the uterine cavity, which is often difficult with the finger alone, especially in cases of unyielding walls or of hour-glass contraction. (8) Its employment does not necessitate the use of speculum and light; and as a consequence a certain amount of exposure, which every woman dislikes, is avoided.

Atmocausis.—Johnson[1] reports 31 cases in which he used this agent successfully. He introduces steam into the uterus from an ordinary throat-atomizer (after the cervix has been dilated with thorough aseptic precautions) through a hard-rubber tube, which is removed after 30 seconds, the uterine cavity wiped out with gauze, and the steam again introduced for 30 seconds. The patient is kept in bed for 4 to 6 days. The temperature of the steam is never above 212° F. The advantage of steam over the curet lies in the fact that it acts only on diseased surfaces in puerperal septic cases, while in cases of chronic hyperplastic endometritis the entire endometrium is affected, while even after thorough use of the curet islands of diseased tissue are often left. Exact clinical evidence was obtained by the author by removing uteri after they had been steamed for different periods and examining them microscopically. It was found that after introducing the steam in the manner above mentioned the endometrium was destroyed, but the muscular tissue was not affected, as was the case when the operation was prolonged beyond a minute. With a longer exposure there is considerable risk of subsequent obliteration of the uterine cavity. Johnson quotes Dührssen as follows: "Arrest of hemorrhages by steam was first employed by Snegurieff, of Moscow, in 1894, for profuse bleeding during the removal of an echinococcus cyst from the liver. Since then evidence has shown that parenchymatous organs can be incised almost bloodlessly, and that hemorrhage from arteries the size of a dog's femoral can be quickly arrested by a jet of steam. The technic is simple. A fenestrated uterine catheter is joined by a gutta percha tube to a small boiler. The steam issuing from it should be at 212° F. Higher temperatures are used by some. In this way dangerous uterine hemorrhage can be arrested permanently and painlessly without an anesthetic." If

[1] Boston M. and S. Jour., Mar. 10, 1900, No. 11.

the steam be allowed to act for 2 minutes, destruction of the uterine cavity and subsequent obliteration take place. Therefore only cases near the menopause should be so treated. In young women, in whom it is only desired to stop the bleeding, the steam should not be applied for longer than a quarter of a minute, and repeated only after the next period if necessary. In order to exclude cases which are unsuitable for this treatment, such as malignant tumors or placental remnants, the cervix must always be dilated first. The instrument, where it passes through the cervical canal, should be protected by rubber. Exfoliation of the uterine mucosa takes place in a week or 10 days. Snegurieff, after experimenting on animals, came to the following conclusions: (1) That portions of liver could be excised without loss of blood; (2) that any part of the spleen could be cut; (3) that whole lobes of lungs could be bloodlessly removed; (4) also of kidneys; (5) also, to some extent, the brain; (6) that it is possible to stop the bleeding from spongy portions of the bones; (7) that almost the whole cornu uteri may be taken out of the bitch without bleeding; (8) that the dog's femoral, cut across transversely, will not bleed after steaming; (9) that bleeding from skin and muscles ceases immediately; (10) that wounds heal by first intention. He has employed it in the human subject in resection of the knee, removal of breasts, fatty and malignant skin-growths, amputation of the cervix, resections of bones, and sequestrotomies; in deodorizing abscesses, and in sinuses and fistulas, especially of a tuberculous nature; and he suggested its use in uterine cases. Kahn (1896) at first used steam at 100° C. for 2 minutes; later on, 115° C. for 15 seconds, and found the latter preferable. He used it in puerperal cases with good effects, sterilizing the uterine cavity and shutting off the blood-vessels and lymph-vessels. Pincus (1897) used it in putrid abortions. Schick (1897) used hot water in place of steam. He used it boiling, with certainty that by the time it reached the uterus its temperature had dropped to 80° or 85° C. He used it from ½ to 2 minutes. Hollande, in 1898, showed an apparatus for the use of hot air instead of steam, and claimed that by it he could get greater heat, measure it better, and apply it more precisely. Cases have been reported in which obliteration of the uterine canal, atrophy of organs, and early menopause have been induced in young women by employing steam at too high a temperature and for too long a period. Pincus, who seems to have very largely employed this method, says: "Atrophy of the uterus with obliteration of the canal cannot be called a mischance; it is inexcusable. Steaming is of inestimable value in inoperable carcinoma of the fundus. In the treatment of subinvolution I regard it as something we cannot do without. It may also be of value in producing artificial sterility." The author submitted four uteri to Dr. Whitman for examination and report, after steaming. He reported that in none had the steam acted to more than three-fourths of the thickness of the endometrium, and then without absolute uniformity. This he considers very satisfactory. A tabulated report of 31 cases follows, which, prior to the employment of steam, would have been cureted.

Sclerosis of the Uterus.—Richelot [1] claims that this is a distinct pathologic condition which should not be placed in the same category with metritis of infective origin, since it may exist in virgins or in women who have never suffered any puerperal lesions. Such a uterus is recognized pathologically by its increased size, extreme hardness, by the hypertrophied endometrium, and large eroded cervix. Microscopically the uterine tissue closely resembles that of a fibroid uterus. The symptoms in young women are largely neuralgic, and are frequently attributed to cirrhotic or cystic ovaries, but persist after the supposed offending organs have been removed. The writer concludes that this particular type of uterine disease is met with principally in neurotic and arthritic subjects; hence he believes that in noninfectious metritis local treatment is more or less useless. He is equally skeptical about the results of intrauterine medication in most cases of metritis of infectious origin, claiming that the cervix should receive the principal attention.

UTERINE DISPLACEMENTS.

Anteflexion.—A. P. Clark [2] gives some interesting suggestions bearing on the etiology of anteflexion. He remarks that anteflexion of the uterus may not infrequently be regarded as a symptom of an undeveloped condition of the genitalia. The state is, no doubt, in many cases, congenital in its manifestation, or is early superinduced by exposure of the subject to faulty hygienic surroundings. Improper modes of dressing during the years of childhood and before puberty have been ascribed as an important factor entering into its causation, but it is often difficult to appreciate how the normal intraabdominal pressure can be so modified as to cause, to any great extent, before the vulvovaginal introitus has been effected by the influences of parturient processes, displacement of so small an organ as the uterus, which for the most part scarcely measures by the sound 2½ inches in depth. The uterus, including its cervix, sustained in its proper position by the uterosacral ligaments, with the axis of the corpus assuming with that of the cervix an obtuse angle, cannot be said to present a condition manifesting pathologic phases, unless there is an accompanying dysmenorrhea or there are marked vesical symptoms. Such a condition of the uterus does not require treatment, unless there has been exhibited a tendency to a greater displacement of the organ, or there is an associated inflammation, or a morbid process in adjacent structures. When the axis of the body of the uterus forms with the axis of the cervix an acute angle or a right angle, pathologic symptoms, more or less severe, are almost always present. Cervical anteflexion is largely due to habitual constipation; this is more apt to occur in girls at the beginning of their menstrual period, when the lower portions of the uterosacral ligaments are in a soft and yielding condition. For this reason, treatment for healthful regularity of the bowels in such subjects should at as early a date as possible be commenced and persevered in. Besides the influence of excessive accumu-

[1] Ann. de Gynéc. et d'Obstét., May, 1900. [2] Jour. Am. Med. Assoc., Aug. 25, 1900.

lation of fecal matter in the rectum or sigmoid flexure of the colon, frequent and long retention of the urine in the bladder is a most prolific predisposing cause. Girls should be admonished that shorter intervals for micturition are absolutely essential; particularly is it so with those who are compelled to stand much, or to take long rides, or who during the hours of the night take regular sleep after undergoing fatiguing or wearisome exercise.

Uterine Prolapse.—A. Lapthorn Smith,[1] in considering "The Operative Treatment of Procidentia Uteri in Elderly Women," thinks that the condition of a woman between 50 and 75 years of age, "with her womb hanging outside of her body, is a pitiable one, and has doubtless attracted the sympathy of the physician from time immemorial." No pessary can be made to keep in place except the cup and stem, and that in itself may lead to serious ulcerative changes in the vaginal mucous membrane. Most of the cases began with subinvolution, possibly the result of a lacerated cervix; and when injury to the pelvic floor is added, the progress of the disease goes on from bad to worse. The author thinks there are two operations to choose from, according to the degree of the prolapse and the size of the uterus. If the latter is small "and not far enough out of the body to become ulcerated, the safest operation is to make a small incision in the abdomen, and catching the fundus with the bullet-forceps, draw it up to the incision and scarify the whole anterior surface of the fundus, and then to sew it to the abdominal wall with buried chromicized catgut." The vaginal outlet may at the same time be narrowed by an anterior and posterior kolporrhaphy. Should, however, the uterus be very long (the sound may enter as much as from 7 to 8 inches) and the cervix ulcerated, it is better to amputate all but the upper 2 inches of it and then perform a plastic vaginal operation. Two important facts the author has learnt from cases he has operated upon: (1) That ventrofixation is, sometimes at least, really a fixation, and, if properly done, a most reliable means of fastening up the uterus; (2) that it must not be relied upon when the uterine cavity is elongated; in such cases the cervix must be amputated. One advantage accrues from ventrofixation and cervical amputation as compared with removal of the uterus, and that is that the bladder and vagina are drawn up by ventrofixation better than when hysterectomy by the vagina is performed. As a cystocele is one of the most difficult cases to cure by plastic operation, the author advises keeping such patients in bed for 6 weeks instead of the usual 3, so that the adhesions may become strong. He concludes, from a large experience of such cases, that the most satisfactory operation for prolapsus is ventrofixation, especially when combined with amputation of the cervix and anterior and posterior kolporrhaphy. I. S. Stone[2] says that it has long been his observation that failures in vaginal plastic work came about through the agency of the cystocele. Restoration of the pelvic floor would not always prevent the cystocele

[1] Canad. Pract. and Rev., 1900, vol. xxv, p. 541.
[2] Pacific Med. Jour., Dec., 1900.

from, to some extent, undoing the repair of the posterior vaginal wall and perineum. Therefore, he says, if we can devise some method of lifting and permanently sustaining the anterior wall with its superimposed bladder and other viscera, it would seem that we have found an additional means of support for a prolapsed bladder, and that we have to this extent still further overcome one of the most annoying accidents due to parturition. Anterior kolporrhaphy, as ordinarily performed, using merely a denudation, is not, in the author's opinion, a uniformly successful and permanent operation for the relief of prolapse of the bladder. Nor does he think that the vaginal wall is overstretched laterally in every case, as it is undoubtedly as much elongated anteroposteriorly as otherwise; this indicates some method of shortening the anterior wall, and the surgeon should not be satisfied with merely "narrowing" the canal. The steps of his operation are as follows: First, incision of the vagina over the cervix; second, separation of the bladder from the uterus and adjoining tissues; third, suture of the vagina to a higher point on the anterior surface of the uterus, with closure of the space made by the separation; fourth, opening the abdomen and further separation of the bladder; fifth, closure of the abdomen; sixth, posterior kolporrhaphy and perineorrhaphy.

Retrodisplacements of the Uterus.—*Etiology and Symptoms.*—E. Schroeder,[1] in view of the frequency of retrodisplacement without symptoms, publishes the following instructive statistics: First, 90 nulliparas with 23 retroversions and 7 retroflexions. Of these, the first group, 74, had no pains in the lower segment of the body, although 19 had retroversion and 5 retroflexion; 25 were virgins, of whom 8 had version and 2 flexion; the other 49 were married or had had intercourse, 11 showing the backward version and 3 flexion. The second group with symptoms, chiefly pain in the lower part of the trunk, comprised 16 patients with 4 suffering from version and 2 from flexion; among them, 3 were virgins with 1 retroflexio uteri and 13 were not virgins, 4 presenting version and 1 flexion. Second, he investigated parous women previous to the menopause, with these statistics: in all 276 cases, 40 versions and 31 flexions. The group without symptoms was again the larger, 191 with 25 versions and 17 flexions. The series having trouble comprised 89 women, 15 with version, 14 with flexion. His last class included all women past the menopause, 45 total, 13 versions, 4 flexions; namely, 38 with no pain, among these 9 versions and 4 flexions, and 7 with pain in 4 individuals with retroversio uteri. After mentioning some anatomic facts relative to the position of the uterus, R. S. Hill[2] states that in his opinion the attachment of the bladder to the pelvic wall assists indirectly in sustaining the uterus, and that the character of its tissue has a tendency to prohibit an increase of its normal anteflexed position. When all parts are normal, nature's provisions are sufficient to prevent uterine dislocation. The departures from normal which permit pathologic retrodeviation

[1] Zeit. f. Geburtsh. u. Gynäk., Bd. XLIII, H. 3, 1900.
[2] Am. Jour. of Obstet., Aug., 1900.

are: (1) Lengthening and loss of tone of the ligaments, and (2) change in the structure of the organ at or near the level of the isthmus. This change, the writer thinks, is invariably due to the retroflexion and not to the lack of development. He gives the causes of retrodislocation as follows: (1) A general weakness, involving the pelvic structures, caused by faulty development or lack of maintenance of the physical forces; (2) sudden tensions on the ligaments, as caused by jolts and jars; (3) corsets or other constrictions around the abdomen, especially before development is complete; (4) neoplasms of the uterus or other pelvic tissues; (5) subinvolution; (6) endometritis and metritis, by increasing the weight of the uterus and impairing the tone of its tissue; (7) peritonitis, by forming adhesions which draw and bind the uterus in the hollow of the sacrum; (8) inflamed appendages falling in the posterior culdesac and dragging on the uterus; (9) destruction of the tone of the posterior vaginal wall, resulting in the formation of a rectocele, which drags upon the uterus; (10) inflammation of the cellular tissue and abnormal distention of the rectum and bladder. In the treatment of retrodislocation an attempt should first be made to remove the etiologic factors. The writer believes that adhesions should be destroyed, not stretched, and that the abdominal is preferable to the vaginal route. When the displacement is due to inflammation of the cellular tissue between the uterus and bladder, this condition should be overcome by repeatedly and forcibly carrying the cervix backward. For maintaining the uterus in its normal position the pessary is useful, but Hill does not think it is indicated in retroflexion. Of the methods for shortening the round ligaments he prefers Alexander's operation, which he considers an ideal operation for retroflexions; but for retroversions he believes it should be assisted by some measure which will shorten the uterosacral ligaments and thus restore their function. The writer condemns vaginal fixation of the uterine body, although acknowledging that it must be used sometimes for want of some better procedure. [Here we decidedly differ from him.]

Treatment of Retrodisplacements of the Uterus. — Edward McGuire [1] states that uterine retrodisplacements may be treated in two ways—by mechanical means and by surgical operation. The method of the reposition of the uterus will depend on the complications present. If there are adhesions, massage should be employed. The sound and repositor are both dangerous instruments except in the most skilful hands. After replacement the uterus may be retained by a well-fitting pessary—the Hodge, Smith, or Emmet will serve all purposes. A pessary is contraindicated in marked inflammation of the uterus and appendages, and when the uterus is held out of position by adhesions and cicatricial bands. The operations preferred by the writer are suspensio uteri and shortening of the round ligaments, generally the Alexander operation. The mortality should be *nil* or almost so in either, but there is less risk in the Alexander. The operation of suspensio uteri has the great advantage of permitting an inspection of the condition of the

[1] Va. Med. Semi-Month., Dec. 21, 1900.

peritoneal cavity. It is preferable when there is a decided prolapse, for it lifts the uterus on a higher level than Alexander's, and thereby fulfils a most important indication. In the occurrence of pregnancy a small percentage of cases has been followed by abortions or difficult labor, which may endanger the woman's life. Carl Beck [1] gives the description of the technic which he has devised for suspending the uterus and the round ligaments. This operation he terms *ligamentotaxis*. The main features of this method consist in opening the abdomen in the linea alba by a small incision, seizing the fundus uteri by traction-forceps, and pulling it outside of the abdominal cavity. This feature is facilitated by the Trendelenburg position. The round ligament of one side is there detected and freed to the extent of nearly 3 inches, the isolation beginning near its uterine attachment; superficial incisions along both sides of the ligament permit the introduction of the grooved directory by means of which the peritoneum can be stripped away bluntly so that no hemorrhage occurs. The bared ligament is then held up by an aneurysm-needle, and pulled out from the abdomen to such an extent that the peritoneal wound-margins can be united underneath. Six to 7 catgut sutures suffice for the purpose. The ligament now rides on the peritoneum. To strengthen this peritoneal anchorage, fascia and muscle are also united underneath while the ligament is suspended. One additional suture through the round ligament usually suffices for fastening it securely. The remaining portion of the wound is dealt with in the usual manner. The margins of the integument are brought together by subcutaneous catgut sutures. Two relaxation-sutures consisting of iodoform-silk are applied through the skin ¾ inch distant from the wound-margin, so that there is no direct contact with the wound-line. For prolapsus uteri suspension on one ligament is often sufficient. Lateral position of the uterus can be avoided by unilateral suspension, but in practice this proves harmless. In retroversion fixation of both ligaments is of course necessary. This is accomplished by treating both ligaments alike. If much tension is to be overcome, incise the internal margins of the rectus muscle on both sides as in Beck's operation for inguinal hernia, liberating a few muscular fibers, hanging the ligament over them, and uniting the flaps. Beck claims for the operation that it has the great advantage of suspending the uterus free and movable in a perfectly normal position, which permits of such free motion that there is no interference either with the bladder or with the rectum, and consequently there is no obstacle to pregnancy. Steffeck [2] reports 25 cases treated successfully by the following method: Douglas's pouch is opened and the posterior vaginal wall is divided longitudinally as low down as the attachment of the rectum. Two fingers are introduced and the adhesions are separated until the uterus is perfectly movable and the fingers can be passed over the fundus. The wound is then closed and the anterior vaginal fornix is opened. While the uterus is drawn downward with a vulsellum, anterior adhesions are separated, and the fundus is secured to the upper angle of a longitudinal incision in the anterior

[1] Am. Jour. of Obstet., Sept., 1900. [2] Centralbl. f. Gynäk., 1900, No. 46.

vaginal wall, which is carried downward from the transverse one. The wounds are then closed with catgut. The writer emphasizes the fact that the adnexa must be removed when they are diseased. He reserves abdominal section for the most severe cases. [It is difficult to understand how one can give such unqualified preference to vaginal over abdominal section for the separation of intrapelvic adhesions. Aside from the fact that the operator can never be sure that he has separated all such adhesions when guided by the touch alone, the opportunities for intelligent conservative work on the adnexa are so much better by the abdominal route that it must commend itself to most American surgeons.] Muratow [1] reports 5 cases in which shortening of the round ligaments was followed by complications. Two patients who became pregnant aborted in consequence of the fact that the ligaments were so shortened that the uterus could not rise into the abdominal cavity. One patient died from septic infection. In two instances the ovaries were imprisoned between the uterus and the anterior abdominal wall. The writer does not deny the great value of the operation, but thinks that greater care should be observed in the choice of cases, especially in young women.

FIBROID TUMOR OF THE UTERUS.

Histogenesis of Uterine Fibromyomas.—Rizzut,[2] as the result of his histologic studies, believes that fibromyomas of the uterus develop from the small branches of the uterine and ovarian arteries in consequence of local irritation; in short, that they represent simply a partial hyperplasia of the uterine tissues. M. D. Jones [3] states her belief that fibroid growths have their starting-points in the inflammatory products of the organ, and that the different stages of development of fibroid tissue can be successfully traced on such a basis. E. S. Bishop [4] believes in the possibility of a syphilitic origin, and advocates the use of mercury and the iodids.

Changes in the Endometrium in Connection with Fibroids.—Peham [5] describes a case of extreme hyperplasia of the endometrium in a fibroid uterus. The mucosa measured an inch in thickness, and under the microscope showed marked glandular hypertrophy, their lumina being dilated so as to form large cavities lined with cylindric epithelium. Many cysts were observed, filled with débris, the lining walls being flattened by pressure. When divided in their long axes they appeared tortuous and corresponded in length to the entire thickness of the mucosa. As the epithelial cells were entirely normal in their appearance and arrangement, there was no reason to infer the development of any malignant degeneration.

Uterine Adnexa in Fibromas.—Greco [6] draws the following conclusions on this subject: (1) In fibroma of the uterus the tubes and ovaries are always altered, even though it may be but microscopically;

[1] Petersburg. med. Woch., 1900, No. 5.
[2] L'Indépendance Méd., Sept. 20, 1899.
[3] Med. Rec., Feb. 16, 1901.
[4] Brit. Med. Jour., Nov. 17, 1900.
[5] Centralbl. f. Gynäk., 1901, No. 48.
[6] Arch. Ital. di Ginec., No. 2, 1900.

there is always a hyperplasia of the muscular fibers and of the mucosa; sometimes only the mucosa is involved; this hyperplasia is of the same nature as the hyperplasia of the uterine mucosa. (2) From these alterations are often due the catarrhal and inflammatory processes in the tubes and ovaries. (3) There may also be an atresia of the tubes due to the tumefaction of the mucosa, or a diffuse adhesive inflammation; cysts are often found, associated with uterine fibromas, due to changes in the Wolffian bodies, or to a dilation of the lymphatics. (4) Ovarian alterations macroscopically consist of a slight enlargement, with the presence of small cysts, which may or may not contain pus. The histologic alterations in the ovaries consist of dilation and obliteration of the blood-vessels with a hyaline degeneration of their walls and a proliferation of the connective-tissue stroma. These alterations produce a diminution of the primordial follicles, and a microscopic degeneration and atresia of the vesicles of Graaf, with the formation of fibrous bodies. (5) Uterine fibromas influence the adnexa mechanically by interference with the blood-supply, due either to direct pressure or indirectly by torsion, as in pedunculated tumors, causing a stasis of blood in the uterine adnexa; this stasis may extend to all the contents of the pelvis, causing a concomitant endometritis or a chronic inflammation of the peritoneal cavity. (6) It is well to remember that ectopic gestation may occur in uterine fibroid conditions and must be differentiated from the real alterations in the adnexa.

Uterine Tumors in Infancy, Childhood, and Early Life.—W. Roger Williams [1] says that there are few parts of the body so little liable to tumor-formation in early life as the uterus. *Myoma:* Of the 56 cases on his list, only 1 was under the age of 20 years at the onset. *Cancer:* This is unknown prior to puberty. Of 500 consecutive cases, the earliest age at onset was 22¼ years. *Sarcoma:* This form of tumor is less rare than the others, but still is exceptional. Holländer reports a case at 7 months, and others at 1½, 2, 3, 10, 11 years, etc. A congenital form of mucosal uterine polypus has been met with by Friedländer, Mandach, and Spencer in newborn children. Mandach found it 35 times in 80 necropsies.

Reproduction of Uterine Fibroids.—Doléris [2] reports 4 cases of myomectomy in which small fibrous nodules which were regarded as insignificant at the time of operation subsequently developed to such an extent as to require removal. In view of his experience in these and similar cases, the writer has decided to remove only pedunculated tumors or those which are easily accessible, where the uterus appears to be of normal size. He thinks that the dangers of hemorrhage and sepsis have been underrated. In future the indications for myomectomy will be limited.

Complications of Uterine Fibroids.—Freund [3] calls attention to the significance of a varicose condition of the veins of the pelvis and lower extremities in connection with fibroid tumors of the uterus. Not

[1] Med. Times and Hosp. Gaz., Mar. 23 and 30, 1901.
[2] La Gynécologie, 1900, No. 12. [3] Centralbl. f. Gynäk., 1900, No. 40.

only is there considerable danger of hemorrhage during and after operation from distention of the pelvic veins, but pulmonary embolism is a possible result. The writer reports 2 fatal cases in which the patients complained soon after operation of severe pelvic pains, with pressure upon the bladder and rectum, followed by a sudden relief of the symptoms, but with restlessness, rapid pulse and collapse, the temperature remaining normal. In both instances a large hematoma was found in the broad ligament, which had exerted so much traction upon the stumps that the ligatures had slipped. The hemorrhage was due to the puncture of large veins below the points at which the ligatures were tied. The same writer describes degenerative changes in fibroids due to sclerosis of the peripheral arteries and venous thrombosis, without purulent foci or evidences of septic microorganisms. The symptoms due to this condition are those of autointoxication, but are quite different from the sapremic or septic poisoning referable to suppuration in the growth. In the case reported the diagnosis before operation was strengthened by the presence of acetone in the urine.

Treatment of Uterine Fibroids.—E. J. Ill[1] stated at a recent meeting of the Buffalo Academy of Medicine that the mere presence of a uterine fibroid was not an indication for operation. The contraindications he grouped under several heads: (1) When the patient was unaware of having a growth or any symptoms therefrom; (2) when she discovered the growth, but suffered neither mentally nor physically; (3) when the symptoms were of minor importance; (4) when she could nurse herself, suffered little, and could afford to be carefully watched; (5) when she had passed the menopause, having an old and likely calcareous tumor, causing few, if any, symptoms; (6) when she was near the menopause and could remain under observation until it was past; and (7) when she was suffering from other and more serious disease likely to lead to fatal results. The cases which were to be treated by operation were: (1) Those in which life was or might be endangered directly or indirectly by the growth, as with the bleeding or septic or twisted or inflamed myoma; (2) those in which health was so impaired that life became a burden, although not endangered, as from large or very movable or very painful tumors; and (3) those in which mentality suffered because of the presence of the tumor, as in sensitive unmarried women, women bordering on the melancholic, and women who thought all tumors must of necessity be cancerous. Olshausen,[2] in reporting a case in which he enucleated a fibromyoma of the cervix, comments on the infrequency of conservative as compared with radical operations for this condition. He limits enucleation of multiple tumors to cases in which, if small growths must be left, the patient is so near the climacteric that there is no danger of their growing. He regards the danger as small, provided that the bed of the tumor is carefully sutured with tiers of catgut. Fourteen per cent. of his operations for myoma (207 in all) have been enucleations with only 1 death. Commenting on the diverse views re-

[1] Buffalo Med. Jour., LV, p. 751, May, 1900.
[2] Zeit. f. Geburtsh. u. Gynäk., Bd. CLIII, H. 1, 1901.

garding the necessity of operating upon uterine fibroids, the percentage of cases selected for operation varying from 14% to 41%, according to the ideas held by different surgeons, the writer states that out of 300 cases in private practice seen during the last 3 years, he had operated upon only 53, or 16.4%, 6 other patients refusing operation. In his opinion, one who operates upon a larger proportion of his cases than this must underestimate the dangers of the operation, some of which—especially embolism and intestinal obstruction—are unavoidable. [This conservative attitude, assumed by such a prominent abdominal surgeon, whose clinical material is enormous in comparison with that of the ordinary operator, is in striking contrast to the radical views expressed by so many lesser authorities. Judging from many of our society discussions, one would infer that in this country the percentage of fibroids selected for operation was often as high as 50% or 75%. Indeed, we have heard it positively affirmed that every fibromyoma of the uterus which could be recognized at the examining table was to be regarded as practically an indication for operation. In spite of the improved statistics of hysteromyomectomy, we would do well to heed the warning that there will always be unavoidable deaths after operation.]

The Treatment of Fibroids in the Nonpregnant Uterus.—E. F. Fish [1] reaches the following conclusions in regard to the treatment of fibroids in the nonpregnant uterus. **Myomectomy** is the operation of choice (1) when the tumor is pedunculated; (2) when it is single, whether subserous, interstitial, or submucous, and can be enucleated without loss of uterine tissue, and the tumor-cavity can be closed and covered with peritoneum; (3) when the desire for an heir outweighs all other considerations. **Hysterectomy** is indicated (1) when the tumor involves so much of the uterus that a cavity too large to be properly closed and covered with peritoneum would follow its removal; (2) when several tumors exist, especially little nodules; (3) when the adnexa are diseased to such an extent that they must be sacrificed; (4) when the disease ceases to be local; (5) when hemorrhage, pressure, or great pain is a persistent symptom; (6) whenever malignancy is suspected or the tumor is of rapid growth; (7) after the change of life. **Palliative treatment** is indicated (1) when the patient is very much reduced from loss of blood, as a prelude to radical cure; (2) when the existence of chronic nephritis, diabetes, tuberculosis, or other constitutional disease forbids radical cure; (3) when the patient is past 40 years of age, the tumor small, the main annoyance hemorrhage, and she is desirous of awaiting the effects of the menopause.

Ultimate Results of Abdominal Myomectomy.—Burckhard [2] summarizes his views on this subject as follows: Unless removal of the cervix is indicated by actual disease or the necessity of drainage there need be no fear of retaining it because of the liability to subsequent malignant degeneration. With few exceptions the ultimate result of hysterectomy for fibroids is good; such reflex disturbances as follow the

[1] Am. Jour. of Obstet., Nov., 1900.
[2] Zeit. f. Geburtsh. u. Gyn'ik., Bd. XLIII, H. 1, 1901.

operation are seldom profound. After castration hemorrhages may be expected to cease, provided that every trace of ovarian tissue has been removed, and in most cases the tumor diminishes in size. Menstrual molimina seldom persist after the removal of both ovaries, but are more common when one or both ovaries are removed, whether the uterus is left or not. Increased nervous irritability is not common, especially if the ovaries have been preserved. Grave psychologic disturbances were never observed by the author. He concludes that it is always better to preserve the adnexa if they are healthy. E. W. Cushing [1] believes that in general it is better to leave the cervix (1) because it makes the operation shorter and easier and gives less chance of hemorrhage during the operation and does not open so much cellular tissue for oozing and decomposition of blood after the operation; (2) because there is somewhat less chance of infection of the wound when only the small cervical canal is cut across and instantly closed by the double tenacula than when the whole vault of the vagina is opened; (3) because the vaginal portion of the cervix is a seat of sexual feeling and worth preserving on that account, and if the cervix is present the women do not feel so much mutilated as when it is gone; (4) because the lower parts of the broad ligaments with the cervix form a better support to the pelvic contents than does the simple union of the vault of the vagina. He believes that total hysterectomy should be performed (1) when the cervix is enlarged and diseased; (2) when the cervical canal is suppurating or septic; (3) when there is any suspicion of malignant disease; and (4) when vaginal drainage appears desirable.

Abdominal Hysterectomy.—Nanu [2] gives the following leading points for this operation: A 45° Trendelenburg position from beginning to end, until the parietal suture begins; a large retractor held at the lower limit of the wound by an assistant standing between the feet of the patient, who shifts it from side to side, always over the point of operation; systematic abandoning of the hemostatic forceps on large vessels, ligating at once instead; ligation of the hypogastric arteries. The foregoing points assist in rapidity and the following in asepsis: Abandonment of all chemic disinfectants, using only heat for sterilizing; careful walling-off of the peritoneum; reconstruction of the peritoneal layer on the pelvic floor; all ligatures of catgut; all sutures of the same substance except at the skin, where silkworm-gut is used. As to the comparison between this and the vaginal route, he thinks the abdominal the more truly surgical, because it is rapid, free, and complete in its work.

F. H. Davenport [3] points out the **causes of danger which are operative in case the tumor is left alone.** These are, first, hemorrhage. This may become a source of danger no matter what the size of the tumor, and it not infrequently happens that insidiously, and almost unconsciously on the part of the patient, a condition of anemia is produced which may affect the prognosis in case of operation, or

[1] Boston M. and S. Jour., Aug. 23, 1900. [2] La Gynécologie, Dec. 15, 1900.
[3] Boston M. and S. Jour., Aug. 23, 1900.

exceptionally may be fatal. The second cause is the size of the tumor. A large tumor may so press upon the other abdominal organs as to induce serious disease. A third cause is death of a part of the tumor from what is known as anemic necrosis. A fourth cause is the development of malignant disease in connection with the fibroid. [It may be said that these are rare conditions, so rare that they need not really enter into the calculation in considering the prognosis of these tumors; yet they are found too often to be ignored.]

A. A. Warden [1] describes in full the **improved technic of Doyen's abdominal hysterectomy.** *First Step—Abdomen Opened, and Tumor*

Fig. 90.—Illustrating the first step, the abdomen opened, and the tumor drawn out above the pubes; behind are seen the handles of the forceps placed in the vagina (Warden, in Lancet, Oct. 13, 1900).

Drawn out Above the Pubes: The patient (Fig. 90) is placed in Trendelenburg's position and the abdominal wall is incised from the pubes toward the umbilicus and as far above it as is necessary to permit of the extraction of the tumor. The peritoneum is caught on each side of the incision by several catch-forceps and a large compress is thrust in behind the tumor to isolate it and to protect the intestine, etc. The fibroid is then well drawn up and out by means of the large fibroid-screw.

[1] Lancet, Oct. 13, 1900.

Several other compresses are introduced at the sides above the pelvic brim to isolate the field of operation, to prevent the escape of intestines, and to protect the peritoneum from contamination by clots of blood or uterine mucus. *Second Step—Perforation of Douglas's Pouch and Seizure of the Cervix:* If it has been easy to draw the tumor well out of the abdomen its removal should be rapid and simple. The vagina has, of course, been cleansed and long curved forceps are pushed by the

Fig. 91.—Illustrating the removal of the uterus and hemostasis of its pelvic attachments. The cervix is seen caught by the tenaculum after incision behind the posterior lip of the cervix upon the point of the forceps in the vagina. The open blades of the forceps can be seen. The right uterine artery has been caught and the operator is, in the illustration, catching the left uterine artery. (These two illustrations show practically the whole of the ablation of the tumor, as strong traction upon the cervix suffices to separate the uterus, and as a rule no further hemostatic forceps need be applied.) (Warden, in Lancet, Oct. 13, 1900.)

assistant behind the cervix in the posterior culdesac as high up as possible (Figs. 91 and 92). (A maneuver now neglected, but followed by Dr. Doyen in his earlier cases and certainly of use to those unfamiliar with the operation, is to place at this stage a strong silk ligature through the peritoneum at about half an inch below the point made prominent by the forceps in the vagina. The peritoneum is opened at this point and the ligature enables its posterior border to be easily picked up at the close of the operation when the suture of the peritoneum is commenced.)

Douglas's pouch is then incised. This is best done with scissors cutting longitudinally upon the point of the long curved forceps, which then penetrate the peritoneal cavity and are widely opened by the assistant. The incision is extended a little on either side and the cervix is firmly seized by strong catch-forceps, or, better still, by Doyen's special sliding tenaculum, and drawn well up, the assistant steadying the tumor by holding the fibroid-screw firmly embedded in its tissue. *Third Step—Isolation of the Cervix:* It is now easy to feel with the index finger of the left hand the strong lateral attachments of the cervix. Two cuts

Fig. 92.—The result of further traction is seen in this illustration, where the cervix is entirely freed The opened forceps are still seen in the vagina (Warden, in Lancet, Oct. 13, 1900).

with the scissors laterally close to the uterine wall free the cervix from its relations to the lower part of each broad ligament, and being thus freed it is at once easily drawn further up and out. The anterior vaginal culdesac now comes into view and the cervix is separated from it by the fingers or by the scissors, strong traction being made upon it throughout. The right forefinger separates the bladder with the greatest ease, the traction alone, thanks to the loose cellular tissue separating the bladder and uterus, often sufficing to liberate entirely the cervix and the uterus. *Fourth Step—Removal of the Uterus:* Only the lateral vascu-

lar connections now remain, to be simply and rapidly divided as follows: The left forefinger is passed above the superior border of the right broad ligament through the vesicouterine peritoneum and gently but rapidly strips off the right broad ligament, which the assistant then seizes. The surgeon then cuts between the adnexa and the uterus, thus entirely freeing the tumor on its right side. It is then drawn over to the left, the anterior peritoneal covering stripping off as this is done, or, if not, separated by a few cuts with the scissors, and finally only adhering by the upper part of the left broad ligament, which is similarly cut, and the tumor and uterus are removed. *Fifth Step—Arrest of Hemorrhage:* The surgeon then seizes the broad ligament on his side of the patient (the left). The uterine and uteroovarian vessels, which alone are now bleeding, are caught and ligatured, and if care has been taken to cut close to the uterine tissue only minor branches of these arteries will have been opened. The right and left appendages are now ligatured and removed and the pelvic cavity is sponged out. It only now remains to close the peritoneal cavity. *Sixth Step—Closure of the Pelvic Peritoneum:* The right vaginal commissure is picked up with strong dissecting-forceps and a curved needle successively threads it, the retrouterine peritoneum, the peritoneum of the tuboovarian pedicle, and finally the peritoneum between the pedicle and the bladder. A medium silk ligature is passed through the eye of the needle and when drawn tight completely closes the peritoneum over the tuboovarian stump. The left side is similarly treated and a transverse suture between the two closely unites the retrovesical peritoneum to that of Douglas's pouch. Any redundancy of peritoneum or tear should be carefully sutured. A dry compress again sponges out the pelvis and the operating table is placed horizontally. *Seventh Step—Closure of the Abdomen:* This is effected by a deep seroaponeurotic layer with interrupted silk suture or continuous catgut and a superficial skin suture with silkworm or catgut. Thus it will be seen that while the tumor is rapidly removed, much time is spent on the careful suture of the peritoneum and of the abdominal wall.

MALIGNANT DISEASE OF THE UTERUS.

Carcinoma of the Uterus.—*Significance of Hemorrhage after the Climacteric.*—Theilhaber[1] believes that in the majority of the cases hemorrhages before the menopause are due to muscular atony. The atrophy of the uterine muscle which is present after the climacteric takes place gradually and is associated with stenosis of the arteries, so that even when the uterine contractions are feeble there is but slight loss of blood. If, however, this atrophy takes place before the stenosis occurs, the muscular contractions are too feeble to control the hyperemia, hence there result profuse menorrhagia, edema, and hypertrophy of the uterine tissues. This same atony is the cause of menorrhagia in young girls, in chlorotic and tuberculous patients. The prolongation of menorrhagia in patients with uterine fibroids is doubtless due to atrophy

[1] Münch. med. Woch., 1900, No. 14.

of the uterine muscle, with resulting prolonged hyperemia of the mucosa and the development of endometritis fungosa. In consequence of this hyperemia the tumor may grow rapidly at this time, while submucous interstitial growths tend to become polypoid. Landau [1] insists upon the importance of regarding all hemorrhages at this time with suspicion, and believes that women should be examined from time to time in order to be sure that their genital organs are in a normal condition. While local atheroma of the arteries, senile endometritis, etc., may account for this symptom in some cases, one should always regard cancer as the most probable condition. In this connection he refers to a series of 190 cases investigated by an English gynecologist in which neoplasms were found in 100 patients, half of these being malignant. E. C. Davis [2] writes that at the time of the menopause atheromatous changes are likely to take place in the blood-vessels, malignant diseases make their appearance, and the atrophic changes of the tissues become observable. After menstruation has ceased, any hemorrhage from the uterus is always pathologic, the causes of hemorrhage at this time being granular endometritis, atheroma of the uterine blood-vessels, vasomotor relaxation, uterine polypus, uterine myofibromas, and carcinoma of the uterus. Of this last newgrowth, hemorrhage is the danger-signal which, if appreciated by the physician, may result in years of comfort and health to the victim. If neglected, however, a horrible death awaits the patient. During the early history of carcinoma the tumor is local and circumscribed, but later becomes hopelessly disseminated. The cervix is the most frequent seat and epithelioma the most common form of malignant tumor. The history of hemorrhage after the menopause with offensive discharge is almost pathognomonic of malignancy. The most rational treatment is complete removal of the uterus, with the appendages, before extension has taken place into the surrounding tissues.

Epithelial Ingrowths in the Myometrium.—Meyer [3] describes the microscopic appearances in sections made through 7 uteri, which were extirpated on account of obstinate hemorrhages which had not been relieved by frequent curetment and cauterization. In 5 nothing abnormal was noted to account for the bleeding except glandular processes which dipped down into the submucous muscular layer. The direct cause of the hemorrhages was inferred to be certain degenerative changes in the blood-vessels, which were more or less constant. The writer believes that the cell-processes were the result of local irritation, and that the hypertrophy of the muscles in this vicinity was sufficient to cause a marked increase in the blood-pressure. If this supposition is correct, total extirpation is the only cure for such hemorrhages, and is fully justified in view of the tendency of these benign glandular ingrowths to become malignant. The curet, however vigorously used, does not reach the seat of the trouble. The positive diagnosis of this condition is seldom possible clinically, but it should be suspected when

[1] Centralbl. f. Gynäk., 1900, No. 46. [2] Obstetrics, Sept., 1900.
[3] Zeit. f. Geburtsh. u. Gynäk., 1900, Bd. XLIII, H. 1.

no improvement is noted after repeated curetings, while the microscope shows no evidence of malignant disease. On the contrary, it should not be forgotten that the hemorrhage may be due to a small polypus at the fundus or at the cornua. [This paper is exceedingly suggestive in that it throws new light upon a class of cases which often cause the surgeon great anxiety, lest he may, on the one hand, advise a radical operation for a condition in which it is not justified, or, on the other hand, may counsel delay in a case of incipient carcinoma when early intervention is important. Doubtless the most conservative will agree with the writer, that the persistence of hemorrhage after repeated cureting, especially in a woman above 40 years of age, amply justifies total extirpation.]

McMurtry,[1] as a **prophylaxis in cancer,** says more operations ought to be done for lacerations of the cervix. A woman between 40 and 50 years of age who has borne children ought invariably to be examined, and, when the physician finds she has a laceration of the cervix or a deep ulceration in the neck of the uterus, it ought to be repaired. Here is the greatest field of usefulness there is in connection with this disease. It is a very simple operation, has no mortality, and brings about a great deal of relief to the patient. All women who have the slightest disturbance of the menstrual function, or any hemorrhage from the uterus after the age of 40, ought to be very carefully examined, with a view of finding an old laceration of the neck of the uterus, and, if such a condition be found, it ought to have immediate attention. Sterile women and unmarried women who have never borne children do not, as a rule, have cancer of the uterus; multiparous women, who have borne a large family of children, are the ones especially prone to cancer of the uterus. The only way this can be explained is upon the hypothesis that there is some connection between laceration of the cervix and cancer; that there is something about the lacerated uterine neck which invites the morbid process.

Early Recognition of Cancer of the Uterus.—Humiston [2] says it has been his experience that the **most common form of cancer of the cervix, the adenocarcinoma, is by far the most to be dreaded** (1) because of its natural growth in expanding laterally into the parametrium; (2) because the lymphatic vessels and glands in the parametrium are so small that they may easily be overlooked, yet may be infected; (3) because of the indirect connection to the chain of glands over the iliac vessels. He argues for (1) early differentiation of malignant growths of the cervix; (2) careful consideration of the importance of the lymphatic vessels and glands in their capacity as drains of the different portions of the uterus; and (3) that abdominal section with complete removal of these special groups of lymphatics alone offers in suitable cases the chance against a recurrence of carcinoma, particularly when the cervix is affected. M. Handfield-Jones,[3] from a study of uterine cancer, concludes that in cases of corporeal cancer there is a stage of benign adenoma. Uterine scrapings are not perfectly reliable, owing

[1] Am. Pract. and News, Mar. 15, 1900.
[2] Jour. Am. Med. Assoc., Sept. 29, 1900.
[3] Brit. Med. Jour., Jan. 19, 1900.

to the tissue being only superficial, and the deep part of the gland not being obtained. Later scrapings, when the disease is more advanced, are therefore more reliable. Clinical signs are more valuable than microscopic evidence. The degree of malignancy varies much, and the disease may run a very slow course. Rapid increase in the size of the body of the womb is the most valuable sign in determining the need for extirpation of the whole organ.

Malignant Adenoma.—Selberg [1] has had the opportunity of examining a large number of preparations which microscopically were true adenomas, but the clinical history of which was that of carcinoma. There is a considerable difference of opinion among authors as to whether the malignant adenomas should be considered as a distinct group of new-growths. The malignant adenomas of the uterus have provided most of the literature of the subject; Schröder was the first to give an accurate description of these growths, and divided them up into adenoma diffusum and adenoma polyposum. Most authors have followed him in distinguishing the disease from carcinoma; but Kaufmann has maintained, on the ground of a single specimen of a growth originating in a cervical stump left after supravaginal amputation, that there is no distinction between the two. The author describes two specimens of cervical adenoma and three of adenoma of the body of the uterus clinically malignant, but consisting entirely of glandular proliferation —that is, spaces lined with epithelium resting on a fibromuscular framework. The cells were all of the one type; there is not the polymorphism of cancer-cells, nor are the solid masses or columns of cells characteristic of the latter disease found in the malignant adenoma. Five cases of malignant growth of the digestive tract are also described, all microscopically true adenomas. In these, as in the uterus, polypoid excrescences are a common characteristic. Single benign polypi are, of course, not uncommon both in the uterus and intestine; in the latter also there may occur extensive multiple polyposis without malignant characteristics, but this condition in either situation should always suggest malignant adenoma. The author considers that this type of growth is distinct from true carcinoma, in that it retains its glandular characteristics both in primary growth and metastases, that the cells are of one constant type, and that no solid masses or multiplied layers of cells are formed. Sinclair [2] believes that this neoplasm develops more slowly than carcinoma. He thinks that it is difficult to distinguish microscopically between benign and malignant adenoma, except that the glands show an irregular arrangement in the latter. Invasion of the subjacent muscular tissue by the glands is the only positive evidence of malignancy.

Cancer of the Body of the Uterus.—Calderini,[3] out of 150 cases of uterine cancer under his care, observed 8 in which the cervix was quite healthy. The diagnosis was always made by scrapings, and vaginal hysterectomy was recommended in all; 6 patients consented; 3

[1] Virchow's Arch., Bd. CLX, H. 3, 1900. [2] Centralbl. f. Gynäk., 1900, No. 4.
[3] Ann. de Gynéc. et d'Obstét., Sept. and Oct., 1900.

have recovered and the disease has not recurred. In the first the operation was performed in 1891, in the second in 1892, and in the third in 1893. The first patient was 38 when operated upon; she had been subject for 3 years to hemorrhage, and recently the discharge had become fetid. The second was 46; she suffered when 45 years old from amenorrhea for 12 months, followed by fetid mucous discharge for 4 months. The curet brought away fragments which showed adenoma becoming malignant. The third patient was 59, and 4 years after the menopause (which seemed delayed till 55) a show came on about once a fortnight, lasting for 1½ years, when the operation was done. Thus, though cancer of the body is rare, it is by no means unknown, and fungous endometritis must always be looked upon with suspicion. Calderini insists that when this affection is diagnosed by the curet in an elderly patient, the uterus should be removed at once, as it is exceedingly prone to degenerate into adenocarcinoma of the body. By acting on this principle there will be no fear of recurrence or of operating when it is clear, on the evidence of what is discovered during the hysterectomy, that the disease has advanced beyond the limits of the uterus.

The Coexistence of Carcinoma and Fibroma in the Corpus Uteri.—Dorland [1] reports a case of cancerous degeneration of an intra-uterine fibroid nodule. He remarks that a brief study of the microscopic features of uterine fibromyomas will explain the great rarity of this form of malignant degeneration of such neoplasms, and the evident reluctance of the scientific gynecologists to admit the possibility of such a change. As Madden has clearly indicated, uterine tumors are at the outstart almost entirely myomatous in nature, but sooner or later in most cases they become modified by the increasing development of the connective-tissue sheaths of the muscular fibers, so that more or less of a fibrous nature is superimposed on the original tumor. Klebs pointed out that during this process of transformation into a fibrous growth the lymph-spaces and blood-vessels within the tumor are obliterated in part, and the line of demarcation between the individual muscle-fibers becomes indistinct or even totally lost. In the small minority of the cases the original tumor retains its myomatous tissue, appearing as a growth composed of smooth muscular fibers of a grayish-red transparent color and evidently contractile in nature. In either case epithelial formations are completely wanting and the development of a carcinoma is, histologically, impossible. On the contrary, the development of myxomatous and sarcomatous degenerations would be expected to occur if the tumor malignantly degenerated at all, and clinical experience has amply demonstrated this to be the usual, though rare, form of malignant degeneration of uterine fibroids, the process proceeding from the neighborhood of the blood-vessels, and invading only the muscular tissue, which undergoes a speedy proliferation with the production of a rapidly-growing one-sided malignant tumor. As to the nature of the muscular tissue from which the uterine myoma develops, the theories are again at variance. Can they develop from the mature muscular fibers of the adult

[1] Phila. Med. Jour., Mar. 30, 1901.

womb? Senn maintains that they cannot, while Winckle inclines to the belief that they do not come from muscle-tissue at all, but that they spring from the uterine interparietal blood-vessels, and Klebs from the connective tissue of the blood-vessels. Velpeau's theory that they develop from small clots in the uterine walls has been disproved by Pozzi, and Kleinwächter's belief in their origin in a round-cell formation along the course of the capillaries has not been substantiated. There seems to be much reason in the arguments advanced by Anderson that these fibroid tumors are localized or diffuse hypertrophies of embryonic (mesoblastic) uterine parenchymatous tissue, and composed, therefore, of unstriped muscular fibers. Whichever of the foregoing theories we may be inclined to accept as the most plausible, it remains true that from their histologic formation carcinomatous degeneration would seem to be an impossible occurrence. How, then, are the undoubted cases of this rare complication that have been recorded to be explained? Madden claims that genuine carcinomas can only proceed out of fibromyomas in cases in which the formation of the tumor extends to the surface of the mucous membrane; secondary extension of the carcinoma into a myoma may then happen in the same way as into the normal uterine muscular tissue from the endometrium, either continuously or discontinuously. Such seems to have been attempted in one of the cases reported by Babcock from the clinical service of C. P. Noble, in which the capsule only of the fibromyoma had been invaded by an epitheliomatous growth originating in the cervix. Roger Williams, in his paper on "The Question of the Origin of Malignant from Nonmalignant Uterine Neoplasms," claims that in cases of this kind the cancerous disease usually spreads from the mucosa to the fibroid by the way of the perivascular lymphatics, and goes on to say that "in like manner uterine fibroids projecting into the abdomen sometimes become cancerous through extension of the disease from adherent neighboring organs, as the ovary, intestine, and omentum." Kümmel records a case of secondary cancerous involvement of a subperitoneal fibroid, the primary disease originating in an adherent ovary. "A number of instances have been recorded," Williams proceeds to state, "of fibroids projecting into the uterine cavity and bearing on their surface a cancerous growth or ulcer." Examples of this kind have been reported by Schramm and Ehrendorfer in corporeal polyps, while Frank, Wahrendorff, and J. Williams have recorded instances in which the polyp was attached to the cervix. A second method, not so common as the foregoing, by which a uterine fibroid tumor may become the seat of secondary cancerous degeneration, is by metastatic dissemination of the malignant disease from a primary focus at some remote portion of the body. An incident of this rare accident is recorded by Schopter, the patient suffering from a primary cancer of the lung, a uterine fibroma ultimately presenting a secondary nodule of the disease. Finally, the rarest method of all by which a fibroid tumor may become the seat of malignant changes is by primary involvement of the tumor itself. Roger Williams claims that hitherto only about a dozen instances of this occurrence have been re-

corded, and in most of these the evidence is far from being thoroughly convincing. Dorland concludes, from the foregoing study of the clinical and histologic manifestations of reported cases, that it is possible for fibroma and carcinoma of the uterus to coexist, and that this coexistence may manifest itself in one of three distinct ways as follows, given in their order of frequency: (1) Fibromyoma of the corpus uteri with carcinoma of the cervix, the increased vascularity of the uterus and the irritant leukorrheal discharges attendant upon the benign tumor favoring in those women so predisposed the development of cervical malignancy. (2) Fibromyoma of the corpus uteri with associated adenocarcinoma of the endometrium, the malignant disease not invading the benign tumor, but originating either in the tubular utricular glands or in the included glandular vestiges which may be present. (3) True cancerous degeneration of an adenomyoma, the malignant change originating in glandular vestiges, included in the uterine growth, or the carcinomatous disease invading the benign growth by extension from an endometrial adenocarcinoma through contiguity of tissue.

Treatment of Inoperable Carcinoma of the Uterus.—Grusdew [1] has employed calcium carbide in a number of cases of inoperable uterine cancer. Guinard was the first to introduce the treatment and to recognize that the effect is produced by the disinfectant action of acetylene and the caustic action of the lime, which are produced when calcium carbide comes in contact with water, according to the formula $CaC_2 + H_2O = C_2H_2CaO$. The patient is placed in the lithotomy position, the vulva and vagina are disinfected, the cervix is exposed with a Simon's or Cusco's speculum, and the vaginal walls and the surface of the tumor are dried with cotton-wool. One or two fragments of calcium carbide are then placed on the surface of the tumor by means of dry forceps, and are kept in place by a tampon, which is so arranged as to protect as much as possible the healthy parts of the vagina from the caustic action of the lime. The fragments of carbide are selected so as to correspond in shape to the surface of the growth, a pointed conical piece for a crateriform ulceration and a plate-shaped piece for a superficial ulcer. The patient can then go about her work. In 1 to 3 days' time the tampon is removed, and a douche of carbolic acid or perchlorid of mercury is given to remove any necrotic masses of growth and fragments of lime. According to the condition of the ulcerated surface the procedure may be repeated at once or not until the symptoms (hemorrhage, etc.) recur. The calcium carbide may also be applied in powder form through a vulcanite insufflator. After a single application, all ragged, easily-bleeding excrescences are destroyed, and there remains a clean wound, which generally does not bleed, or bleeds very slightly, and gives rise to very little secretion. Hemorrhage, the most dangerous symptom of advanced carcinoma, is always arrested, however obstinate or of long standing it may have been. During the actual treatment the fetid discharge generally increases, but soon after the removal of the tampon it diminishes and loses its intolerable odor. In many cases the

[1] Münch. med. Woch., June 12, 1900.

pain is alleviated or removed, though this anesthetic action of the carbide is not always obtained. After a week or perhaps longer the symptoms gradually return, and the treatment requires repetition. Though the results are less permanent than those obtained by operative measures, such as scraping the growth with a sharp spoon and cauterizing it with the thermocautery or bromin, the simplicity of the procedure makes it unrivaled under certain conditions; for instance, in out-patient work, and in practice when assistance or instruments are unobtainable. In Grusdew's experience the treatment is devoid of danger and painless, though some French gynecologists have reported cases in which it was painful. In one case the acetylene is said to have been developed so suddenly that it exploded and blew the speculum out of the vagina; the patient fainted, but was otherwise unharmed. In other cases the acetylene has forced its way through the uterus and tubes into the peritoneal cavity and caused violent abdominal pain. These accidents can be avoided (1) by well drying the vagina so that the acetylene is not developed too suddenly, and (2) by not plugging so tightly as to prevent the escape of the gas by the vagina. The writer never observed diarrhea or other symptoms of general calcium-carbide poisoning.

Küstner [1] recommends the following procedure, which he has adopted successfully in cases of advanced cancer of the cervix. After thorough curetment and cauterization of the diseased areas a tampon saturated with alcohol is applied to the raw surface. A large transverse opening in the rectovaginal septum above the sphincter ani is made, and its edges are sutured with catgut. A long thread attached to the tampon is carried through the fistula and brought out at the anus. Kolpocleisis is next performed, the vulva being closed with sutures of silkworm-gut, the denuded surfaces being made as broad as possible. The tampon is withdrawn through the anus on the fourth day. As the external wound may not heal perfectly, additional sutures may be required subsequently. It is advisable to irrigate the vagina occasionally through the fistula and to dilate the latter with the finger if it becomes contracted. In case of hemorrhage the vagina can be tamponed (through the fistulous opening?) or irrigated with cold (?) water. The writer states that patients are considerably benefited by this operation, being relieved of the constant acrid, foul-smelling discharge. [The writer does not appear to take into consideration certain dangers which may follow closure of the vagina, especially that of septic infection from the retention of discharges and fecal matter in the pocket below the fistula. The difficulty of arresting a profuse hemorrhage from the ulcerated surface after kolpocleisis has been performed may readily be imagined.]

Operative Treatment of Carcinoma.—T. S. Cullen [2] refers to the **gradual improvement in the operation for carcinoma** of the uterus, commencing with amputation of the cervix as practised by Schröder and his contemporaries, abdominal hysterectomy as recommended by Freund, the catheterization of the ureters as employed by

[1] Centralbl. f. Gynäk., 1900, No. 14. [2] Buffalo Med. Jour., Oct., 1900.

Pawlik and Kelly, and the more radical operation consisting in the removal of the iliac glands as advocated by Ries, Rumpf, and Clark. He then points out the danger of implanting carcinomatous into healthy tissue, as is very likely to occur when the radical operation is performed, and describes in detail the operation as performed by Werder, of Pittsburg. In this operation the chance of implanting carcinomatous tissue is reduced to a minimum. The various stages in the abdominal operation, when the cancer is limited to the cervix, are as follows: (1) Removal of broken-down carcinomatous cervical tissue, preferably a few days before; (2) insertion of ureteral bougies, if desired; (3) ligation of the ovarian vessels and round ligaments; (4) freeing of the bladder from the uterus and broad ligaments; (5) opening of the broad ligaments, location and freeing of the ureters to the points at which they enter the bladder; (6) ligation of the uterine vessels near their points of origin; (7) dissection of the bladder free from the vaginal vault; (8) dissection of the rectum from the vaginal vault; (9) removal of the pelvic lymph-glands; (10) freeing of the vaginal fornices; (11) closure of the pelvic cavity by uniting the vesical peritoneum with that of the rectum, an assistant meanwhile making strong traction on the cervix from below; (12) closure of the abdomen; (13) ringing of the vaginal vault with a thermocautery or knife, thus freeing the uterus and its surrounding vaginal mucosa; (14) application of a light gauze-pack to the space left in the vaginal vault. As will be noted, the uterus is freed on all sides, the vagina dissected loose from the bladder and rectum, and the pelvic and abdominal cavities closed before the operator comes in contact with the carcinomatous cervix. Even then there is little or no danger of transplantation of carcinomatous tissue. Cullen advises this operation in all cases in which the patient is not excessively stout. Of course, in such instances we have frequently to rely on a vaginal operation entirely. In adenocarcinoma of the body of the uterus the same operation may be performed, but the wide removal of the vaginal mucosa is not necessary.

H. A. Kelly [1] shows by a table of collected cases from the large clinics in Europe that among 31,482 patients suffering from cancer, in 21.4 % the stomach is the seat of the growth, and in 29.5 % the uterus. He reiterates the dictum already generally accepted that "in every case of cancerous uterus the entire organ must be removed." He quotes his own experience of 176 cases to show that, although epithelioma tends to be limited to the vaginal portion and that glandular carcinoma shows a remarkable tendency to limitation at the internal os uteri, still there are many exceptions. He also definitely states that the **tubes in all cases of cancer of the uterine body should be removed.** The next locality of importance is the vaginal vault. "Cervical cancer in many instances extends down the vagina in an invisible form under the mucosa, without at first causing any perceptible infiltration or blush of color to excite suspicion." It is most necessary, therefore, to "give the disease a wide berth in the vaginal side, cutting at least 2 to 2.5

[1] Jour. Am. Med. Assoc., May 19, 1900, p. 1215.

centimeters away from it." He recommends, if there be the slightest involvement of the bladder-wall, that the organ be opened and the healthy flaps brought together after excising the disease. If the rectal wall is much involved, the author's experience is that the cellular tissue laterally is affected. He further states that in his opinion "cancer of the cervix usually extends by direct involvement of the contiguous tissue. Extension by glandular metastases *per saltum* is unusual in the earlier operable stages of the disease." The author then asks whether it is worth while operating on any case of cancerous uterus. One hundred and three cases of his own in which microscopic examination was very carefully carried out can be divided as follows: Well without relapse on January 1, 1900: (1) squamous-celled carcinoma of the cervix, 61 cases, 13 in all living, or 21 %; (2) adenocarcinoma of the cervix, 12 cases, 2 in all living, or 16 %; (3) adenocarcinoma of the body, 30 cases, 19 in all living, or 63 %. The time elapsed varied from 6 years to 11 months. As regards the operation, the author says that "the old plan of skinning or shelling out the bare uterus is of all methods the most liable to be followed by a recurrence, and must be abandoned." He insists "on the supreme importance of catheterizing the ureters," as he always does, in order to mark them out during the operation and so act as a guide and allow the operator to excise more freely. The author concludes by describing his method of "quadrisection of the uterus" for the more complete removal of the disease. "Thorough curetage with a serrated spoon-curet; division of the vagina on all sides an inch below the diseased area; separation of the vagina from the bladder up to the vesicouterine peritoneal fold, which is widely opened; a wide opening of the posterior culdesac. The uterus, now hinged by its broad ligaments, is brought out through the anterior opening, as in Martin's operation on the adnexa. This is easily done by pushing back the cervix and climbing up the anterior face of the uterus, step by step, until the fundus is reached, with stout toothed-forceps. The peritoneum posteriorly is well protected by an abundant loose gauze-pack. The next step is the sagittal bisection of the uterus from the fundus through the cervix and the attached vagina with scalpel and scissors. As the uterus is cut in halves in this way each median surface is grasped and held down by strong toothed-forceps. One half, the most affected, is now allowed to retract into the vagina while half the body of the uterus of the other side is removed by bisecting it horizontally at the cervical junction, cutting from the median cut surface out into the broad ligament and exposing in this way the uterine artery which is clamped." The remainder of the operation is on the lines usually laid down, but the author considers that if the ureter is involved it should be excised and the cut end turned into the bladder. He enumerates 11 cases thus treated, all of which resulted in recovery, but sufficient time has not elapsed for any definite facts as to recurrence to be made public.

According to Robert Sorel, [1] curetage, with cauterization, and vaginal

[1] Gaz. de Gynéc., Nov., 1900.

amputation of the cervix, can only be regarded as palliative remedies, in spite of the opinion of Dayot, of Rennes, of Tessier, and of Pomad. Vaginal hysterectomy, in spite of its low mortality and the prolongation of life that it gives, cannot be regarded as a radical operation, as it leaves behind the glands and periuterine tissues. Abdominal hysterectomy, on the other hand, enables the whole mass to be removed together with glands. Bellœuf is of opinion that it is impossible to determine exactly what parts are infected by the cancer, as it has a tendency to invade neighboring organs,—vagina, broad ligaments, glands, etc.,—also to spread into the body of the uterus, rendering it more friable and more likely to infect the peritoneum at the time of operation. On one point, however, authorities are agreed; that cancer of the body, and in old people, advances more slowly. The diagnosis of invasion of neighboring parts is difficult; pain is only presumptive evidence; want of mobility of the uterus is another sign. Affection of the glands is almost impossible to make out. According to Roger Williams, they were affected in 56 out of 78 autopsies. Abdominal hysterectomy seems to be the only certain way of finding out. Bellœuf concludes that local recurrence takes place in the majority of cases, hence the necessity for an operation that removes the disease widely. Supposing one were called on to deal with an ideal case in which the uterus was movable, and every point favorable for operation; which should one choose—the abdominal or vaginal route? Surgeons are not content in operating on a breast-cancer simply to remove that organ, but insist on cleaning the axilla, often finding glands affected which it was impossible to make out by manipulation. In the vaginal operation so much is left at the sides of the uterus that it is wrong to consider it a radical operation; the abdominal operation allows us to attempt the removal of glands and all infected tissues, and should be the operation selected. It has other advantages: it allows removal of a larger growth, and diseased organs in the neighborhood, hemostasis is more certain, and the bladder and ureters less likely to be damaged. The contraindications are common to both—viz., debility, kidney-disease, diabetes, heart-disease, or excessive stoutness. It follows, therefore, that not only are extensive cancers amenable to the abdominal route, but in a larger degree the limited cases, which have been hitherto treated by the lower operation. When there is evidence of much invasion of neighboring organs it is better not to operate at all, for the mortality is raised and recurrence is rapid. It is usual to test a question of this sort by the consideration of a large number of cases. Advocates of the lower operation contend that its low mortality compensates for the increased risks and higher mortality of the high operation. One must consider (1) the result of the operation and (2) the late results. (1) **In the Vaginal Operation:** Out of 3057 cases, 254 patients died, a mortality of 8.30%. Some surgeons have even a better percentage of recoveries than this, owing to the employment of the more recent improvements in technic and a careful selection of suitable cases. (2) Surgeons agree that the results are deplorable, that cure is the exception, and survival over 3 years is ex-

ceedingly rare. Thus, in 884 recoveries, 93 lived 3 years and 26 as long as 5 years. (1) **Abdominal Hysterectomy:** In 454 cases there were 127 deaths, a percentage of recovery of 27.9. This compares badly with the 8.30 of the vaginal route. It is only fair to state, however, that the abdominal operation has only been recently perfected, also that many of the cases were unfit for the lower operation. Taking only favorable cases operated on by improved technic during 1900, out of 112 cases there were only 6 deaths—a percentage of 5.35. We may reasonably suppose that in future, in fairly selected cases, there will be but little difference in the mortality from the two operations. (2) **The Results:** Unfortunately, the operation is of so recent a date that it is impossible to give complete statistics. The author concludes his paper by saying: (1) That cancer is rarely limited to the uterus, but invades early. (2) That an operation, to be radical, must remove the uterus, part of the vagina, tubes and ovaries, broad ligaments, and glands. (3) That the abdominal route fulfils these obligations.

That **vaginal hysterectomy has failed as a satisfactory treatment for cancer of the uterus,** and more radical procedures are being generally entertained, is amply illustrated by a recent discussion of the subject before the New York Academy of Medicine.[1] Pryor, Boldt, Janvrin, Polk, Gill, Meyer, Ramsay, and Dudley expressed their views upon the subject, and while all did not speak in emphatic terms of their preference for the abdominal route, none doubted its efficacy in a large number of cases, and admitted they were seeking methods offering a great deal more assurance than vaginal hysterectomy. Pryor advocated more radical treatment. Recurrence after operation was seen in the perimetric structures in 96%, so a successful operation must remove not only the uterus and adnexa, but a considerable portion of the vagina and adjacent glands. These glands are in three groups: (1) The obturator glands; (2) the glands situated near the bifurcation of the common iliac; (3) the glands of the uterosacral folds. Removal of the obturator glands is the most important. The important point is that the immediate mortality must not be so high that one dare not depart from mere palliative means. A collection made abroad of 3155 vaginal operations gave a mortality of 9%, and he has himself shown that that of the abdominal operation in America is 11.8%. Abdominal hysterectomy by progressive ligature is not the proper operation for cancer. The next fundamental principle is that in the act of removal all possibility of infecting the wound by either cancer-cells or the particularly septic contents of a cancerous uterus must be avoided. The first step in either operation should be a thorough curetage and cauterization which disinfects the mass and closes to a certain extent the mouths of the absorbents. He believes that in cancer of the cervix the sum total of human life saved by palliative methods is far greater by vaginal hysterectomy. In all the great clinics only 70% of the women come within the operable stage. Boldt cannot advocate either operation in all cases. Personally, he thinks that in only exceptional instances

[1] Med. Rec., Dec. 8, 1900.

should abdominal hysterectomy be performed until we are in possession of facts proving its superiority over vaginal hysterectomy. The advantage of abdominal hysterectomy is that it permits more extensive removal of the lymphatics and retroperitoneal glands. He doubts, however, whether it will give a larger percentage of recoveries because of the frequency with which the lymphatics are not involved even in the late stages. Time alone will settle this question. Polk said that his

Fig. 93.—Vaginal hysterectomy, June 1, 1895. *a*, Cavity of the body of the uterus enormously dilated; it contained fetid pus (pyometra), which escaped during the operation; *b*, cut surface of the wall of the body of the uterus; *c*, growth in the cervix, "squamous-celled epithelioma"; *d*, internal os; *e*, peritoneal surface of the uterus; *f*, external os (Lewers, in Lancet, Jan. 5, 1901).

experience in this field has been so ghastly that he doubts whether he could add valuable material to the discussion. Of all the cases of cancer of the uterus upon which he had operated, he had cured, he believed, only 1, and all patients had died from recurrence of the disease. All operations hitherto offered were of but little value, being nothing more than an effort to make the patient's condition somewhat more tolerable. He had searched for some more extensive and radical operation, but

even the more recent extensive and radical operations seemed to hold out little encouragement. He preferred the more open field of the abdominal route, because he had not been able to do a sufficiently extensive operation through the vagina, though well knowing the seriousness of the abdominal operation. Ramsay believed that in the greater number of cases the suprapubic method was preferable, and believed it a mistake to attempt to adhere to any one operation. The combined operation might perhaps in the future be found more generally useful. Enlarged lymphatic glands do not necessarily mean that cancer has invaded them; the increase in size sometimes means mere hyperplasia. Dudley would recommend the combined operation. It causes no more shock than the suprapubic alone. Porter also prefers the combined route, except in cases of extensive involvement; then only the vaginal route should be selected.

Fig. 94.—High power. The squamous character of the epithelial cells is here represented, and in the center keratoid and other degenerative changes have taken place. The cells have separated from the stroma by shrinkage (Lewers, in Lancet, Jan. 5, 1901).

König[1] finds that the **more favorable the immediate results of vaginal hysterectomy, the less satisfactory are the after-histories.** He prefers abdominal hysterectomy after Freund's method, which he has practised in 7 cases, with 3 deaths. This high mortality was due to the fact that all cases were too advanced to allow of the vaginal operation. Peiser's practice was adopted; that is to say, that the pelvic cellular tissue was carefully cleared before the removal of the uterus, of glands, lymphatic vessels in connection with the genitals, and plain muscle-fibers. The operation is long, lasting from 2½ to 3 hours, but very little blood is lost. Preventive ligature of the hypogastric artery is unnecessary and useless, as the collateral circulation is too freely established. As much as possible of the pelvic peritoneum should be saved. Thorough isolation of the ureters is of high importance, and can be done without catheterism of those ducts. On the morning of the operation the cancerous tissue is thoroughly scraped out and cauterized, and just before the abdomen is opened the cavity made by the scraping is once more cauterized and the vagina thoroughly disinfected.

[1] Centralbl. f. Gynäk., No. 43, 1900.

A. H. N. Lewers[1] presents the **after-results in 40 consecutive cases of vaginal hysterectomy performed for cancer of the uterus,** and shows some illustrations of a severe case which thus far ($6\frac{1}{2}$ years after the operation) has remained well. (See Figs. 93, 94, 95.) He concludes that in a certain proportion of cases patients suffering from cancer of the uterus may be relieved by operation for periods of many years, so that there seems some probability that the relief may be permanent; that the proportion of cases in which this result can be expected must remain very small so long as patients generally only seek advice at a late stage of the disease, and that consequently the great desideratum is early diagnosis.

Fig. 95.—Low power. Solid branching columns of squamous-celled epithelioma are shown infiltrating the substance of the cervix uteri. Large cell-nests are present, as well as areas of granular degeneration in the centers of the epithelial processes (Lewers, in Lancet, Jan. 5, 1901).

AFFECTIONS OF THE PELVIC VISCERA.

The Experimental Production of Hydrosalpinx and Hydrometra in Animals, and its Relation to Hydrosalpinx in the Human Subject.—C. J. Bond[2] recalls that in a previous article he established the fact that in rabbits, guinea-pigs, and other animals a typical hydrosalpinx could be induced by antiseptically ligaturing the Fallopian tube close to the cornu of the uterus and also at its beginning; the fluid thus produced closely resembles the fluid of a human hydrosalpinx. If the ligature be placed instead about the uterine cornu, the cornu distends above the ligature and a hydrometra results, the fluid resembling that derived from the tube. The fact that in the lower animals the secretion of the uterus and of the tubes is so much alike corresponds with the slight degree of differentiation between these two portions of the oviduct; whereas in the human subject, differentiation having advanced further, the uterine secretion is a mixture of blood, mucus, and epithelial débris, at least during the menstrual period; whether in the intermenstrual period a saline watery fluid be produced and reabsorbed we do not know. In animals there is an

[1] Lancet, Jan. 5, 1901.

[2] Lancet, July 22, 1899.

important difference between ligature of the uterine cornu and ligature of the tube. If the tube be ligatured only at the uterine end, no distention takes place, the secretion probably occurring, but escaping into the abdominal cavity, where it is absorbed. If, however, the cornu be ligatured at any point, the cornu distends above the ligature with resulting hydrometra, any backward current being prevented, even though the tube remains unobstructed and the passage seems to be clear in the other direction. This throws light upon the fact that distention of the human uterus with blood or fluids does not cause backward distention of the tubes, except in cases of mechanical displacement or bacterial infection; it does not oppose the view that spermatozoa may enter the tube. A number of points are illustrated by the following case: In a young girl, whose vagina was absent, an attempt to restore the canal by dissection resulted in a septic endometritis followed by a right pyosalpinx; on abdominal section the left tube was found normal, except that it ended in a culdesac close to the uterus. Not only did this case illustrate the direct extension of the infective process in the case of the right tube, but also in the left tube that occlusion at the uterine end does not produce hydrosalpinx. This absence of regurgitation from uterus to tubes, even under pressure, in animals, led the writer to think that the menstrual fluid occasionally found during menstruation in human tubes originated therein. Conditions in the human subject are different, however, and it appears that in cases of retroversion of the uterus regurgitation of the uterine menstrual fluid does actually take place into the tubes; it is suggestive that in these cases there was great congestion of the fundus due to mechanical displacement. This regurgitation has been proved in some cases by means of particles of carmin. It seems to be demonstrated that in animals, and in the human subjects as far as the Fallopian tube is concerned, the mucous membrane of the oviduct has a characteristic secretion. This secretion seems to be absent during pregnancy. A rabbit in which one cornu was ligatured became pregnant in the patent cornu; on killing the animal at term it was found that no hydrometra had occurred in the ligatured tube, although it was somewhat larger than formerly from hypertrophy of the mucous membrane similar to, but less marked than, that in the pregnant cornu. An analogous condition is present when pregnancy takes place in one horn of a human uterus bicornis; and a case is cited of extrauterine pregnancy in the subject of a uterus bicornis in which both uteri presented a well-marked decidua. It appears, therefore, that the uterine secretion is associated with the ordinary destructive processes of the generative canal and not with the constructive processes and increased tissue-growth of pregnancy. We must not regard human hydrosalpinx as a final condition in infective inflammation of the tube, but only as a mechanical distention by normal secretion, due to closure of both ends of the tube by inflammation, while pyosalpinx occurs when the infection has invaded the whole tubal mucosa, destroying its secreting powers and changing it into an abscess-cavity. Another interesting fact—that the fluid in a simple

parovarian cyst closely resembles that in distended Fallopian tubes—points to the origin of these cysts in a hyperdistention by physiologic fluid of a portion of the efferent ducts of the paroöphoron.

Physiologic Relations between the Uterus and Adnexa.—Roubinstein [1] conducted a series of experiments in rabbits and dogs with a view to determining the effect upon the uterus of removal of the ovaries alone, the tubes being preserved. It was found in the majority of cases that removal of one ovary was followed by marked compensatory hypertrophy of the remaining one. Microscopically a decided increase in the number of Graafian follicles and corpora lutea was observed. No anatomic changes in the uterus resulted from extirpation of one ovary, but after removal of both the endometrium invariably became atrophied, including the surface epithelium and glands, and general proliferation of the connective tissue and atrophy of the muscular fibers occurred. When transplanted or left free within the peritoneal cavity the ovaries sometimes atrophied, sometimes preserved their functional activity, the uterus maintaining its normal anatomic structure or the reverse, according to the condition of the ovaries. The writer concluded that removal of the uterus alone was not followed by any anatomic or physiologic changes in the ovaries, while the tubes were also not affected. Resection of the normal ovaries was followed by complete restoration of tissues and glandular elements, without the formation of true cicatricial tissue, while no alterations were noted in the uterus and tubes. [It should be borne in mind that the conditions present in aseptic operations upon healthy animals are essentially different from those encountered by the abdominal surgeon. It is one thing to resect normal nonadherent ovaries, and another to excise macroscopically diseased portions of these organs after separating adhesions which naturally tend to reform. Hence the prognosis as to subsequent atrophy of the ovaries after conservative operations must always be doubtful.]

Torsion of the Fallopian Tube.—Hartmann [2] adds 5 cases to the 10 previously reported. In 7 of these the tube alone was twisted, while in 5 the ovary shared in the torsion. In 10 the right tube was affected. In some cases the tube was previously diseased, while in others the pathologic changes present (especially hemorrhages) were due to the torsion. The vessels in the pedicle were nearly always filled with thrombi. Clinically the symptoms noted were sudden pain, simulating appendicitis or intestinal obstruction; or successive attacks occurred like renal colic, the latter being in cases of gradual torsion. Localized peritonitis and a rapid increase in size of the affected tube were constant. Van der Berg [3] reports a case of torsion of a pyosalpinx, with complete separation of the tumor, which he believes to be unique; also a similar case of hydrosalpinx, and another in which the tube was completely separated from an ovarian cyst as the result of torsion. He

[1] La Gynécologie, Feb. 15, 1900.
[2] Compt. Rend. de la Soc. d'Obstét., de Gynéc., et de Ped., Feb., 1900.
[3] Centralbl. f. Gynäk., 1900, No. 48.

collected from the literature 36 cases, distributed as follows: hydrosalpinx, 23; pyosalpinx, 5; neoplasms of the tube, 5; complete separation of the tube as the result of torsion, 3. He believes that while in the case of the larger tubal sacs torsion is due to the same causes as in ovarian tumors, in that of the smaller enlargements some other etiologic factor must be sought, possibly the persistence of the infantile type, predisposing to inflammation. In these cases there may be a tendency to torsion from the beginning, which is favored by early closure of the uterine end. The writer thinks that torsion of the tube occurs more frequently than is ordinarily supposed; in fact, that it is probable that this is a common cause of hydrosalpinx and of hematosalpinx not due to atresia of the genital tract. The attacks of colicky pain often noted in connection with these conditions may be thus explained. The importance of torsion in ectopic gestation is evident, since it may lead to rupture.

Primary Carcinoma of the Fallopian Tube.—E. Mercelis [1] states that since 1888, when primary carcinoma of the Fallopian tube was first satisfactorily demonstrated, but 20 authentic cases have been reported. She reports an additional case, illustrating her article with a plate. Novy [2] publishes a full report of a case under the care of Pawlik. The patient was a widow, aged 70; she was extremely fat, and had a pendulous abdomen. She had borne 10 children. Cancer of the vagina was diagnosed, but nothing more than kolpitis granulosa detected. A sanious discharge was distinctly noted. The curet being used, a piece of tissue was removed which bore the character of adenocarcinoma; but at every other point on the endometrium that was scraped the tissues only showed evidence of endometritis glandularis. Hysterectomy was performed August 11, 1896, Pawlik reserving publication till a sound after-history could be obtained. The vagina was divided around its attachment to the cervix, but the uterus was not freely movable, and could not be drawn downward. An abdominal incision was therefore made. Then a tumor was detected. It consisted of the right tube. The uterus was removed, together with the right appendages; the ligatures, excepting one applied to the right ovarian vessels, were drawn down into the vagina. The vaginal wound was closed and the abdominal wound drained, because the patient was so fat. Recovery from the operation was complete, though slow. The patient enjoyed 2 years' complete immunity, then recurrence set in, causing death in 5 months. The tube was quite healthy in its inner or uterine third, and the remainder was the seat of cancer, apparently malignant degeneration of a papilloma. The malignant deposit in the endometrium was secondary.

Appendicitis and Salpingitis.—In a discussion before the Leipzig Obstetrical Society, Firth [3] called attention to the fact that the appendicular ovarian ligament described by Clado, instead of being con-

[1] N. Y. Med. Jour., July 14, 1900.
[2] Monatssch. f. Geburtsh. u. Gynäk., June, 1900.
[3] Monatssch. f. Geburtsh. u. Gynäk., 1900, Bd. LX, H. 2.

stant, is the exception. He believed that the frequent occurrence of appendicitis as a complication of disease of the right tube and ovary was due to the tendency of the appendix to descend into the pelvis and to become adherent to the tube. In most of these adherent cases such changes will be found to have occurred in the walls of the appendix that its removal is indicated. Saenger thought that it was important to inspect the appendix in all cases of inflammatory disease of the adnexa. The former might contain a pus-focus even when there were no evidences of periappendicitis. Zweifel raised the question whether purulent salpingitis could arise from the migration of colon-bacteria or streptococci from an adherent suppurating appendix, without actual rupture of the abscess into the tube, because it had been proved that these microorganisms did not cause suppuration when brought in contact with the healthy tubal mucosa. Krönig thought that when appendicitis and pyosalpinx coexisted it was exceedingly difficult to discover the origin of the process. Delagénière [1] reports 26 cases of appendicitis associated with diseased adnexa, only 4 of which were acute. He believes that the inflammation of the appendix is usually secondary to its attachment by adhesions, thrown out in consequence of disease of the right tube and ovary. The interference with the circulation of the appendix renders it peculiarly liable to become inflamed. The type of inflammation is usually subacute or chronic. This explanation does not apply to all cases, since in some it is clear that appendicitis was the primary condition, the adnexa being infected through the lymphatics in the adhesions. As regards the symptoms, in cases of appendicitis secondary to disease of the adnexa there is usually a history of former uterine or tuboovarian trouble, while the intestinal symptoms are less striking than in a case of primary appendicitis. The attack is apt to correspond with the beginning of the menstrual period, while in disease of the tube and ovary it reaches its greatest severity toward the end. In suppurative appendicitis the pain is more severe, but it may extend below McBurney's point into the painful zone of adnexal disease. In noninflammatory affections the diagnosis is less difficult. The writer prefers a long median incision, even in cases of suppurative appendicitis complicating disease of the tubes and ovaries, since it may be advisable to remove the uterus. The appendiceal abscess can be protected with gauze and the cavity drained through a counter-opening in the loin. Falk [2] reports a number of cases to show the difficulty of diagnosing appendicitis and diseased adnexa. He does not agree with Martin's statement that a history of intestinal disturbances is a strong point in favor of the former affection. As regards the coexistence of appendicitis and disease of the right tube and ovary, he quotes Martin's statistics to prove that this is less common than is ordinarily supposed (13 times in 276 cases of salpingitis). Dührssen found appendiceal complications in 10 out of 322 abdominal sections, while Ochsner reported 15 cases of secondary and tubal and ovarian disease in 51 cases of appendectomies.

[1] La Gynécologie, 1900, No. 12. [2] Centralbl. f. Gynäk., No. 7, 1900.

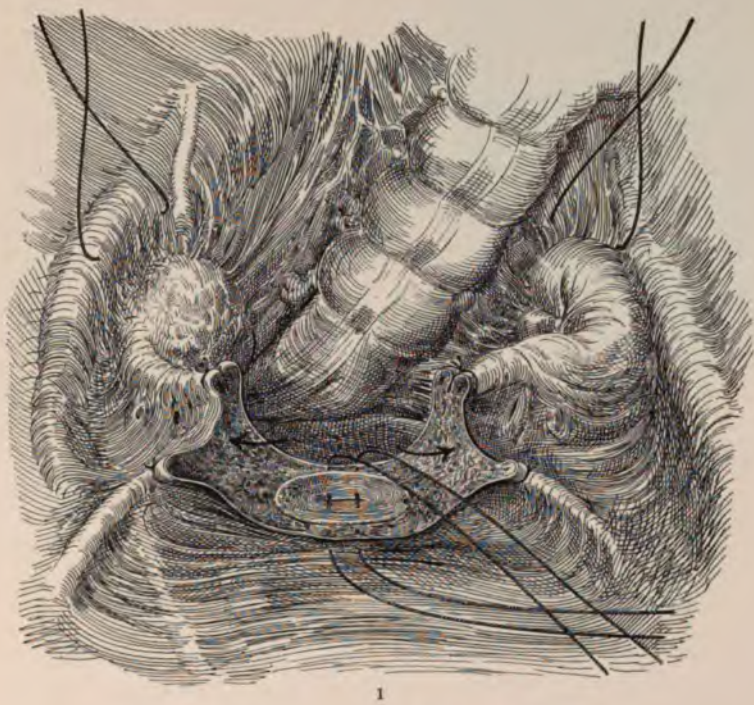
Papillary Tumors of the Fallopian Tube.—Mairez [1] has collected reports of 33 cases, 24 being malignant and 9 benign growths. They develop in cysts which form in the tube without any change in its walls. The benign form presents the ordinary type of an adenopapilloma, the malignant that of epithelioma; the latter may be primarily cancerous or develop from a preexisting papilloma. Papilloma of the tube follows salpingitis. The epithelial cells on the walls of the cysts undergo hyaline degeneration, and the serum fluid which results may escape into the peritoneal cavity, causing general or encysted ascites, or it may make its way into the uterus through the proximal end of the tube, leading to intermittent vaginal discharges. It is not possible to make a certain diagnosis of this condition before opening the abdomen.

Adenomyoma of the Epoöphoron and Paroöphoron.—Pick,[2] from a study of these growths, arrives at the following conclusions: (1) From the parovarium may develop adenomyomas of the broad ligament that contain cystogenous connective tissue with glands which are identical with those of the primordial kidneys. (2) As the tumors develop and undergo histologic changes the differences between those springing from the epoöphoron and paroöphoron become less marked, so that their origin cannot be positively inferred. (3) Adenomyomas, the epithelial elements of which are derived from the primordial kidneys, if they are found in the uterus, tubes, posterior vaginal fornix, or iliac region, are of parovarian origin, while those in the broad ligaments spread from the epoöphoron. (4) The glandular portions of these growths closely resemble the uterine mucosa, and when found in the epoöphoron may simulate an accessory uterus.

Abdominal Section.—*Technic.*—Kelly [3] calls attention to the great value of bisection of the uterus in certain cases of pelvic inflammatory diseases. The steps of the operation are as follows: If the uterus is buried out of view, the bladder is first separated from the rectum and the fundus found. Then, if there are any large abscesses, adherent cysts, or hematomas, they are evacuated by inspiration or puncture. The rest of the abdominal cavity is then well walled off from the pelvis. The right and left cornua uteri are each seized with stout Museaux forceps and lifted up, the uterus incised in the median line in an anteroposterior direction, and as the uterus is bisected its cornua are pulled up and drawn apart. With a third pair of forceps the uterus is grasped on one side of its cut surface, as far down in the angle as possible, including both anterior and posterior walls. The Museaux forceps of the same side are then released and used for grasping the corresponding point on the opposite cut surface, when the remaining forceps are removed. In this way two forceps are in constant use at the lowest point. As the uterus is pulled up and the halves become everted, it is bisected further down into the cervix. If panhysterectomy is preferred, bisection is carried all the way down into the vagina. The uterine canal must be followed in bisection, if necessary, by the

[1] Centralbl. f. Gynäk., 1900, No. 6. [2] Virchow's Arch., Bd. CLVI, H. 3, 1900.
[3] Bull. Johns Hopkins Hosp., Jan., 1901.

PLATE 3.



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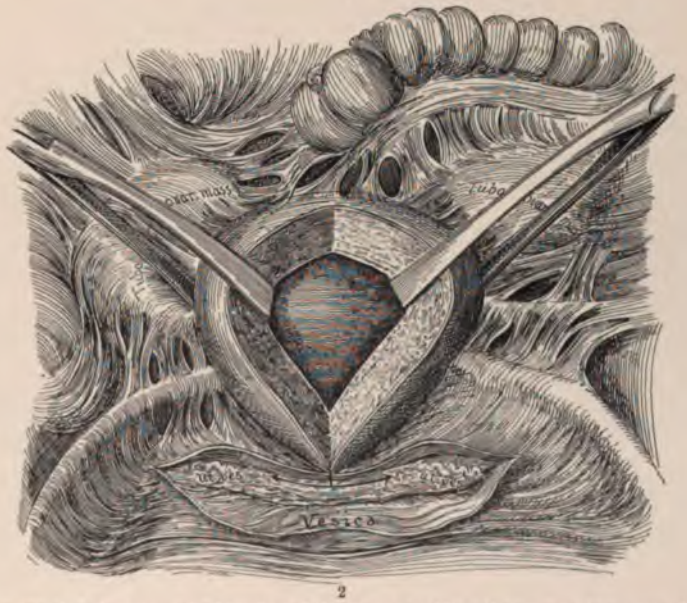
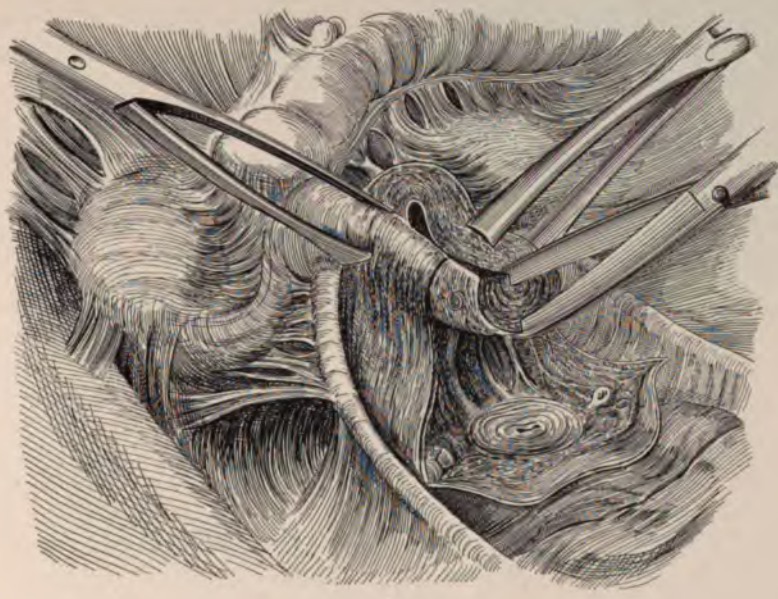


2

1. Showing the advantages of a bisection of the uterus, enabling the surgeon to remove the uterus before removing either tube and ovary, thus affording all the conveniences of more room, abundant illumination, and new avenues of approach indicated by the arrows. Ligatures may be placed on the ovarian vessels as shown before enucleating the uterine tubes and the ovaries, when the vessels are accessible.

2. Showing the first step in the bisection of an adherent retroflexed uterus. The forceps catch the anterior face, which is opened; then the bladder is pushed down, and the cervix divided from side to side as indicated by the arrows (Kelly, in Johns Hopkins Hosp. Bull., Jan., 1901).

PLATE 4.



1

2

1. After freeing the cervix from its vaginal end it is held up, and the bisection completed as shown here, in a direction from below up.

2. The bisection completed. Each half of the uterus is now removed by applying ligatures as indicated by the arrows on the round ligaments and the uterine cornua. The lateral inflammatory masses are removed last of all (Kelly, in Johns Hopkins Hosp. Bull., Jan., 1901).

use of the grooved director. The forceps are then made to grasp the uterus well down into the cervical portion. If supravaginal amputation is preferred, the cervix is bisected on one side. As soon as it is divided and the uterine and vaginal ends begin to pull apart, the under surface of the uterine end is caught with forceps, pulled up, and the uterine vessels exposed. These are clamped or tied. As the uterus is still pulled farther up the round ligament is exposed and clamped, then finally a clamp is applied between the cornua of the bisected uterus and the tuboovarian mass, and one-half of the uterus removed. The opposite half of the uterus is treated in a similar way. Nothing is then left in the pelvis but the rectum and bladder with the tuboovarian masses plastered to the sides of the pelvis and broad ligaments affording abundant room for investigation of their attachments and dissection. The wide exposure of the cellular area over the inferior median and anterior surfaces of the masses offers the best avenue for beginning their enucleation. After bisection of the uterus it is sometimes possible to remove the corresponding tube and ovary with its half, leaving separate enucleation for the more difficult cases. The operation is not recommended to a beginner in surgery. The advantages of this method are additional space for handling adherent adnexa, great increase in facility for dealing with intestinal complications, access by new avenues from below and in front to adherent lateral structures, elevation of structures to or above the pelvic brim, or out of the abdomen for manipulation and dissection, and the advantage of approaching the uterine vessels by cutting across the cervix instead of in continuous transverse incision. The surrounding structures are far less liable to injury, there are fewer troubles and sequels, and the mortality is lessened.

Goubaroff[1] favors **ligating the arteries separately during abdominal operations only after they have been divided.** His conclusions are as follows: (1) By this method the topography of neoplasms can be studied more accurately. (2) There is an absence of venous oozing. (3) Secondary hemorrhage is impossible. (4) Pure ligatures are employed, with a correspondingly less risk of infection. (5) When tissues are ligated *en masse*, it is impossible to note pathologic details, which can be done most satisfactorily when the vessels are tied separately. (6) Undue tension and compression of the tissues are avoided. [While the author's contention that ligation of arteries alone is more surgical than ligation *en masse* is undoubtedly correct, the advantages claimed are not always obtained at the operating-table. There is no reason why the ovarian and uterine arteries should not be isolated and secured in most instances; but in complicated cases it is often impossible to pick up smaller vessels while working deep within the pelvis. The claim that venous bleeding is entirely prevented by ligation of the large arteries is not borne out by experience, since we have seen most annoying venous hemorrhage even after preliminary ligation of both the anterior branches of the internal iliacs.]

Vaginal Celiotomy.—Fritsch[2] lays down certain rules for the

[1] Ann. de Gynéc. et Obstét., May, 1900. [2] Centralbl. f. Gynäk., 1900, No. 40.

guidance of the surgeon, viz.: Vaginal ovariotomy is justifiable only in the case of cysts which are clearly benign in character. Myomectomy by the vaginal route should be limited to cases in which the tumor is freely movable and does not exceed in size a child's head. An old retro-uterine hematocele should be attacked by the vagina only, nor should an attempt be made to extirpate the sac. In cases of recent ectopic gestation, on the other hand, larger than the first-mentioned tumors, which are not easily accessible from below, the abdominal route is to be preferred. Pus-sacs are best emptied by the vagina, but if the operator aims to remove the diseased adnexa and spare the uterus, he should elect celiotomy. Mironov [1] says many of the dangers of the stumps of the Fallopian tubes may be avoided by anastomosing them with the vagina in the following manner: Through an incision in the anterior vault the base of the bladder is freed from the anterior face of the uterus, the vesicouterine leaf of peritoneum is incised and its anterior flap sutured to the front margin of the vaginal wound, shutting out the bladder from much likelihood of damage. The uterus is then drawn down into the wound and the tubes ligated at each cornu. If the ovary is diseased, that adnexum is totally ablated. If the ovary is sound, it is left by separating it from the tube. The incision must be sutured over and over with catgut, to avoid raw edges. Then the tube is removed and the stump drawn down to and sutured along the vaginal wound, hence securing drainage into that canal. The opposite side is treated in the same way. The culdesac of Douglas needs to be opened only when adhesions are too extensive to be handled otherwise.

Angiotripsy.—Ratchinsky,[2] from experiments on animals, finds that while the lumen of the compressed vessel is occluded, the adhesion of the intima is not invariable, while the tunica externa has a tendency to return to its former condition, thus allowing subsequent hemorrhage. He concludes that while complete hemostasis is possible with the use of the angiotribe, in some cases it is only temporary. In vaginal hysterectomy secondary hemorrhage is not infrequent, and may even necessitate abdominal section. Further experience with the instrument is necessary. The use of the heavier models is attended with considerable danger. F. H. Davenport [3] advocates the use of the angiotribe and claims that following its use there is almost no pain, practically no bleeding, and the convalescence is easy and rapid. The compressed tissues are not devitalized. The effect of the instrument is nothing more than a complete compression of the interstitial connective tissue with all its lymph-spaces.

Intravenous Transfusion with Normal Salt-solution.—J. S. Stone [4] gives the technic of intravenous transfusion as follows: The largest vein at the flexure of the forearm should be selected; the median cephalic is preferred if large enough to be easily isolated. An incision is made an inch or more in length and the vein quickly exposed. A double ligature (of catgut preferably) is thrust under the vein with for-

[1] La Semaine Méd., Oct. 24, 1900.
[2] Centralbl. f. Gynäk., 1900, No. 17.
[3] Boston M. and S. Jour., July 5, 1900.
[4] Va. Med. Semi-Month., Nov. 9, 1900.

ceps or blunt needle, and cut so as to leave two equally long ends for tying. The lower or distal ligature is tied tightly around the vein. If the vein is well filled with blood it is easy enough to catch a small fold with forceps, and with scalpel or scissors make a partial cross-section. The cannula is to be inserted while this flap is held in the forceps, and the insertion is easy enough, provided the vein has not become collapsed and almost or quite empty of blood. In the transfusions made by the writer, this has been the only real difficulty. It is a very difficult operation to introduce a sharp aspirator needle into a collapsed vein without puncturing its walls, in which case the fluid will not enter, but will distend the cellular tissue around the vein. Therefore, if one is not provided with a blunt cannula, care should be taken to blunt or dull the point of the ordinary aspirator needle as much as possible, as the introduction will thereby be greatly facilitated. The cannula may be introduced ½ to 1 inch into the vein, and as soon as the point is known to be safely in position, the remaining piece of catgut is provisionally tied with a half knot around both vein and cannula, which prevents escape of either blood or salt-solution from the incision in the vein. If the same care is taken to prevent the

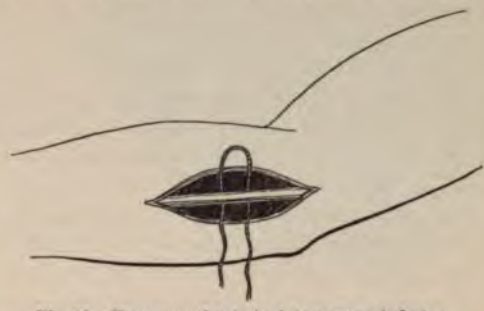


Fig. 96.—Exposure of vein in intravenous infusion (Stone, in Va. Med. Semi-Month., Nov. 9, 1900).

Fig. 97.—Insertion of cannula in intravenous infusion (Stone, in Va. Med. Semi-Month., Nov. 9, 1900).

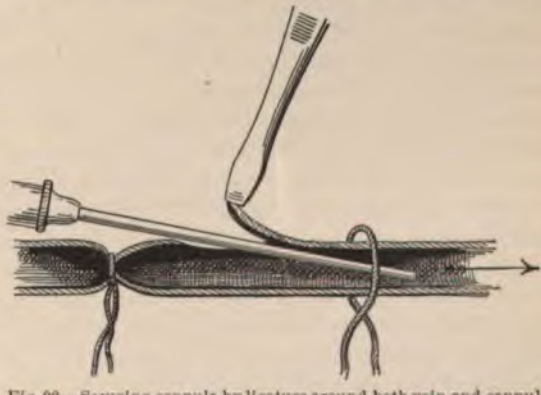


Fig. 98.—Securing cannula by ligature around both vein and cannula (Stone, in Va. Med. Semi-Month., Nov. 9, 1900).

introduction of air that is taken to give a hypodermic of morphin, or any other drug, no accident will occur. The provisional ligature is tied after removal of the cannula, and the wound dressed as a simple incision.

According to F. F. Simpson,[1] the **intraperitoneal use of salt-solution is contraindicated in patients having ascites** at the time of operation (such as complicates malignant ovarian and other neoplasms), because the presence of ascites is *prima facie* evidence of lowered powers of absorption. If not absorbed it is without value and its presence is objectionable. It is also contraindicated in those cases in which sudden perforation of the hollow viscera (as from typhoid ulcer, gangrenous appendix, etc.), or of an abscess, permits large doses of effete substances, bacteria and bacterial poisons to flood the peritoneal cavity. Death from peritonitis is due, not to the local lesion, but to the poison that gains entrance to the blood and lymph-channels, and thus reaches the vital centers. In the cases that come under observation the symptoms prove that large doses of poison have been absorbed. Much fluid is found at operation. It is fair to assume, from the symptoms which demand operation, that this fluid is a virulent poison. To do anything to favor its continued absorption would be most irrational, yet this is the action for which peritoneal infusions of normal salt-solution are chiefly lauded. In these cases they are as positively contraindicated as the use of fats and oils in phosphorus-poisoning.

Lowering of Blood-pressure After Gynecologic Operations.—Schröder,[2] as the result of numerous observations, finds that there is a marked difference in the blood-pressure after the removal of diseased adnexa and of neoplasms of the ovaries and uterus, it being lower in the former case. There is a sudden drop in the pressure during the operation, the curve rising gradually for a few days and then declining to its former level. During long operations the fall is often as great as 40 or 50 millimeters, but within an hour or two the pressure increases, reaching its highest point on the first night or following days. Between the eighth and fourteenth days the curve is lower than at any time, rising, slowly, with slight remissions, to fall again for a short time when the patient first sits up. In severe operations and when the heart is strongly affected by chloroform the blood-pressure increases very slowly and seldom exceeds the average point immediately after operation. In fatal cases the rise is followed by a sudden and permanent fall. In pus-cases the primary rise is greater than in simple ovariotomies, and after a slight fall continues. After vaginal operations the diminution of the blood-pressure is less marked and the succeeding increase less than after celiotomy.

Results of Castration.—Alterthenn[3] reports the results of his observations in 107 cases of double oophorectomy, including 24 cases of supravaginal amputation of the uterus. Complete cessation of menstruation occurred in all the cases of supravaginal amputation. In 55.5 % of the others the menopause was established at once; in 25.8 %

[1] Ann. of Gynec. and Pediat., Nov., 1900. [2] Centralbl. f. Gynäk., 1900, No. 40.
[3] Hegar's Beitr. z. Geburtsh. u. Gynäk., Bd. II, H. 1, 1900.

hemorrhages persisted for different periods, but eventually ceased. In 18.7 % menstruation still continued. Menstrual molimina ceased with the cessation of the flow. Postclimacteric phenomena were almost constant, although they were less frequent and severe after supravaginal amputation with removal of the adnexa. Diminution of sexual feelings was noted in over 68 %. Increase in hairy growth and pigmentation was not observed, and only once a change in the voice. An increase in the body-weight was noted in 29.5 %. Involution of the vagina and external genitals (contraction, stricture, etc.) was quite constant. When uterine fibromyomas were present, they diminished in size in 97 % of the cases. In conclusion, the writer infers that the importance of conservative treatment of the ovaries has been overestimated. He is opposed to the view of Abel and Schmitz, that the ovaries should be preserved in cases of myomotomy, since experience has shown that a second celiotomy may be necessary to remove them. [So much has been written in unqualified support of the practice of preserving portions of ovaries that it is well to have some evidence on the other side of the question. While the practice of conservative surgery is most commendable, it is only fair to state that conservatism has often been carried too far, a second operation being necessary to restore the patient to health.]

Mortality After Celiotomy for Tuberculous Ascites.—Wunderlich [1] utters a warning against indiscriminate operations for tuberculosis of the peritoneum. Analyzing 500 cases, he finds that 68 % were of the exudative variety, 27 % the fibroadhesive, and 4 % purulent. Two-thirds of the first class were observed at least 3 years, and in 23 % of these the ascitic fluid accumulated rapidly after operation. In the 344 cases of the exudative variety the primary mortality was 22.6 % ; 23 % were well 3 or more years after operation. Operations were most unfavorable in the suppurative variety, over 50 % succumbing at once or a short time after. The writer has no doubt that abdominal section has a favorable influence upon tuberculosis of the peritoneum, but would not go so far as to affirm that it is the only and certain means of effecting a cure. Spontaneous cure undoubtedly occurs, and it is possible, as Galti and Hildebrant believe, that the most successful results are obtained in cases in which retrograde processes have already begun in the tuberculous nodules when the abdomen is opened. Cases for operation should be carefully selected. Simple ascites without complications offers the best prospect of a permanent cure.

Complications During and After Abdominal Section.—*1. Sponges, Ligatures, and Other Foreign Bodies in the Peritoneum.*—Carl Beck [2] says that sponges, compresses, and other large foreign bodies are sometimes left in the peritoneal cavity and make their way outward in a miraculous manner. Sometimes they make their way into the bowel and pass with the intestinal contents with comparatively little disturbance. Foreign bodies will either become absorbed, encysted, or enter the cavities of the intestines or uterus. Foreign bodies produce local vascular peritoneal adhesions, the contraction of which gradually pushes

[1] Arch. f. Gynäk., Bd. LIX, H. 1, 1900. [2] Med. Rec., Nov., 1900.

the body into the intestine. In one of the writer's cases a large sponge was removed from an abscess in the abdominal wall, and in another case one passed by the rectum. Sponges are not left in the abdominal cavity purposely, but ligatures are; silk is usually unabsorbable, but in some cases it may disappear. It is possible that, like gauze-sponges, ligatures may also work their way into the intestine and thus be discharged without the knowledge of the patient. This may have been the case when the ligatures are said to have been absorbed. For this reason absorbable material should be used as much as possible, and sutures should be interrupted. If the suture does excite suppuration, it is much more difficult to get rid of a continuous suture than an interrupted one, because of the length of thread. When symptoms arise from a buried suture, a way for the thread to make its way outward should be opened. In some cases absorbable sutures may act like foreign bodies.

2. Ileus.—Winternitz [1] distinguishes three varieties of postoperative ileus, viz.: that due to septic peritonitis, that due to adhesions of the intestines of nonseptic origin, and a third form caused by pressure from clamps, gauze, etc. The latter can be avoided in vaginal operations by extreme elevation of the pelvis. His conclusions with regard to the treatment of this complication are as follows: (1) In cases of nonseptic intestinal obstruction following vaginal operations an attempt should first be made to separate the adhesions through the vagina; this failing, the abdomen should be opened. (2) When ileus follows an aseptic celiotomy, the wound should be reopened and the distended gut incised in several places. (3) The same treatment is applicable to cases of paralysis of the intestine. (4) Operative treatment is useless in postoperative septic peritonitis. A. Goldspohn [2] remarks that according to the showing of Lenclos, ileus is more frequent after vaginal hysterectomy than after other abdominal sections. This is, as we could expect, chiefly in all cases in which the abdominal or pelvic cavity is not closed; for in these cases two or three of the chief causes of peritoneal adhesions are quite generally present; *i. e.*, (*a*) raw surfaces, (*b*) infection, and (*c*) a foreign body (the drain). The secondary operation for the relief of postoperative ileus, to be successful, must be performed early, before mechanical obstruction has caused infection and paralysis of the bowel (peritonitis). The symptoms and signs which speak mostly for ileus are abdominal distention without marked tenderness to touch on gentle pressure; the presence of rhythmic colicky pains; a slow pulse that is not wiry; fecal vomiting; vermicular motion of the small intestine, seen or felt through the abdominal wall; increased proportion of indican in the urine.

3. Peritonitis.—The peritoneum is a joint of vast dimensions, says Byron Robinson,[3] consisting of four elements, viz., endothelial cells, interendothelial spaces, stomata vera lined by granular polyhedral cells, and stomata spuria, irregular openings between the endothelial cells. Its functions are to prevent friction between moving viscera, to anchor and support the viscera, to limit them so that they may not become

[1] Centralbl. f. Gynäk., 1900, No. 40. [2] Med. Rec., Sept. 8, 1900.
[3] Med. Rec., July 28, 1900.

entangled, to furnish them with an elastic covering, to absorb and secrete fluid, and to protect from infection by throwing out barriers of exudate. Its cavity opens directly into the lymphatics, and its absorptive powers become greatest in the region of the diaphragm. Therefore infection in this region is most likely to become systemic, while in the region of the gall-bladder, the appendix, or the pelvic organs there is great chance for local peritonitis, without sufficient absorption to produce a general toxemia. Peritonitis saves life by building barriers against infection, while absorption causes death by sepsis. In the diagnosis temperature is of little value, while the pulse is always rapid, and there are tympanites, muscular rigidity, tenderness on pressure, and the facies peritonii. Patients with septic peritonitis bear anesthetics badly, and during operation should receive hot rectal injections or hypodermics of strychnin and whisky. The rapid fluid-absorption argues against irrigation in laparotomy, as thus the germs become widely and rapidly distributed. The best drain is a rubber tube inclosed in strips of gauze. After the operation, give calomel, 1 grain, and magnesium sulphate, half a teaspoonful, hourly for 5 or 6 hours. This revives intestinal peristalsis, starts the secretions, and affords drainage from the mucosa. The exquisite tenderness found in the locations of tumors or in the pelvis generally indicates local peritonitis, and this may form adhesions which can cause dull aching sensations for years. Excluding perforation, peritonitis occurs from trauma, and at the bowel-flexures, the sphincters of the intestine, and the fimbriated ends of the oviducts. The latter opening directly into the peritoneum account for so much pelvic peritonitis in women. The symptoms of pelvic lymphangitis are pain, rapid, small, wiry pulse, nausea, vomiting, tympanites, and a temperature of 101° to 105° F. In the chronic form there are tenderness, palpable exudates, pain, disturbances in the vesical, rectal, and menstrual functions, irregular tympanites, indigestion, anemia, and, finally, neurosis. The usual situation of the mass of exudate is in Douglas's pouch. The treatment is by douche, tampon, massage, extrauterine electricity, general measures, and rest in bed during menstruation. In the acute cases, rest in bed, hot cornmeal poultices, opiates, liquid diet, with calomel and magnesium sulphate for the bowels. As the condition subsides, douche twice a day and use the boroglycerid tampon twice weekly.

DISEASES OF THE OVARIES.

Primordial Ova and Follicles in Senile Ovaries.—Amann [1] describes the histologic appearances in ovaries removed from a woman aged 63. They contained cavities lined with cylindric epithelium, many of the cells having large nuclei; these cavities were surrounded by spindle-cells which stained deeply. Smaller cell-processes were seen near the periphery of the ovary with cystic dilation. The cells corresponded perfectly to those of the primordial ova in the fetal ovary, while the spindle-cells were identical morphologically with the epithe-

[1] La Presse Méd., 1899, No. 76.

lium of the primitive follicles. The epithelial cysts and pouches doubtless originate from the germinal epithelium, as all the transitional forms are seen in serial sections. Cells like those of the primordial ova have been described in papillary and carcinomatous ovarian cystomas, but the writer believes that the case reported is the first in which the early development of adenocystoma from the germinal epithelium has been actually demonstrated, since primary follicles as well as primordial ova were present. [This seems to prove that ovarian cysts develop from the germinal and not the follicular epithelium. It is surprising that the germinal epithelium in a senile ovary should preserve its activity and show the proliferative changes peculiar to fetal life.]

Ovarian Insufficiency.—F. Jayle [1] uses the term ovarian insufficiency to describe those cases characterized by hypofunction. These disturbances are not well understood. From a clinical standpoint he studies these symptoms to determine if they are due to suppression of the ovarian secretion, and if this can be diagnosticated by the character of the symptoms themselves. He comes to the conclusion that such a diagnosis is possible if the inquiry is especially directed to determine whether the disturbed function is transitory or constant, and if the pain starts directly from the ovary. The treatment is to be based largely upon the pain. Valuable indications are reached by the use of desiccated ovaries or ovarian extract. The physical examination is by no means so important; ovaries which are cystic and enlarged may contain more normal ovarian substance than those which appear quite normal as to size and consistence. The latter, however, may be in a condition in which all normal ovarian substance has been replaced by sclerotic tissue. In the surgical treatment of such ovaries, whether cystic or sclerotic, it is always proper to remove all of the diseased portion, as such pathogenic tissues are devoid of function. All healthy ovarian tissue should be preserved.

Ovarian Hydrocele.—Reed Burns [2] reports 3 cases which lend proof to Sutton's views that the so-called tuboovarian cysts are cases in which the ovary and distal end of the tube have been shut in by adhesion into an unusually deep ovarian fossa, the space so formed and its communicating tube having become distended with fluid, and that they should be called ovarian hydrocele. These cases reported are not cases of tuboovarian cyst, nor strictly ovarian hydroceles, but they show that the ovary may be shut up in a hermetically sealed pocket on the posterior side of the broad ligament, without the distal end of the tube being included. In operating in such a case, the condition is recognized by sweeping the fingers over the posterior surface of the broad ligament, where no ovary is found, but instead a more or less elastic spot is felt in the ligament. This should at once make us think of an imprisoned ovary. A ligature should be thrown around the tissues containing the ovarian artery on the pelvic side, and another around the artery and tube close to the uterus, the tissues over the ovary should be split, and the ovary and tube removed.

[1] La Presse Méd., Mar. 17, 1900. [2] Penna. Med. Jour., Mar., 1901.

Ovarian Grafting.—R. T. Morris [1] says that ovarian grafting has its analogue in the grafting of portions of the thyroid gland, in which it has been necessary to remove that entire structure; no matter in what part of the body the graft is transplanted, it usually continues to perform its function. The cases of pregnancy which have occurred after double ovariotomy are due to the fact that a small portion of the ovary remains. In one of his cases in which he reopened the abdomen some months after a double-tube operation, a small portion of the ovary on the distal side of the ligature was found to have retained its vitality. Such fragments of ovarian tissue have been thought to undergo absorption, but such is probably not the case. As early as 1895 he attempted the transplantation of ovarian tissue, in the hope that it would furnish the internal secretion of the ovary and thus avoid a precipitate menopause. His cases of ovarian grafting number 12, of which 6 have been sufficiently well observed to admit of conclusions being drawn. In ovarian grafting he places the ovary that is to serve for a graft in physiologic saline solution at a temperature of about 100° F. In his early operations the graft was placed in a slit in the fundus of the uterus, but in later cases he has chosen the broad ligament as nearly as possible at the point that the ovary would normally occupy. By splitting the broad ligament and introducing the graft, it can be sutured in such a way that the inner surface of the ovary projects into the peritoneal cavity, while the right surface of the ovary is in contact with the denuded surface exposed by splitting the broad ligament. The result so far obtained in his experience is an avoidance of the menopause, the patients continuing to menstruate in a way that indicates that the grafts retain their vitality. In one of his cases pregnancy took place, but there was an early abortion. [The result of operation upon animals is favorable to the contention that a grafted ovary will retain its vitality, will sustain menstruation, and in some cases which are exceptionally favorable may furnish a healthy ovum.] Mauclaire [2] reports 7 cases of **subcutaneous transplantation,** and reviews the literature quite thoroughly. In 4 cases the grafted ovary became infected and was removed a few days later. In the 3 others it could be felt 3 months after operation. He concludes that the ovary can be successfully transplanted both from the same and from a different individual, provided that it be absolutely aseptic. [Disturbances of menstruation and troubles following single or double oophorectomy may be relieved in this way. If it is not deemed advisable to leave the ovary within the abdominal cavity, subcutaneous implantation may be tried, but never in cases in which infection is suspected. If there is a rise of temperature within 24 hours after operation, the ovary should be promptly removed.]

Symptoms of Solid Ovarian Tumors.—Dartignes [3] presents a résumé of this subject as follows: **Fibroma:** Symptoms may be entirely absent in the early stages, aside from occasional colicky pains and disturbances of menstruation. On examination, a smooth, hard, movable tumor,

[1] Med. Rec., Jan. 19, 1901. [2] La Gynécologie, 1900, No. 12.
[3] Centralbl. f. Gynäk., 1900, No. 26.

not larger than a mandarin, is felt in the culdesac or at the side of the uterus. As it increases in size menorrhagia or metrorrhagia may be present. Later, pressure-symptoms and enlargement of the abdomen are noted, occasionally moderate ascites. The general health is rarely affected, and the tumor may exist for 15 years. Incision of the pedicle is rare. **Sarcoma:** There may be few symptoms in the early stage, though ascites may develop rapidly. Pain and disturbance of menstruation are more common than in the case of fibromas. The results of physical examinations are nearly the same in both, except that edema of the lower limbs often accompanies sarcoma, and both ovaries may be affected. The growth of sarcoma may be slow (13 years in one case) or rapid; it is favored by pregnancy. Metastasis is indicated by ascites, edema, enlarged abdomen, and rapid decline in health. The prognosis as regards recurrence after operation is better than in the case of cancer. **Cancer:** The latent period is uncertain, and ascites is by no means a constant accompaniment. Pain is often absent at first; emaciation and general symptoms occur earlier than in the case of fibroma and sarcoma. There is no characteristic menstrual disturbance; pressure-symptoms are gradual in their development.

Primary Carcinoma of the Appendix Vermiformis.—E. Hurdon [1] reports a case of primary and one of secondary carcinoma of the vermiform appendix. In the literature there are references to 10 cases of carcinoma originating in this organ. Of these, however, only the 3 cases in which the diagnosis was confirmed by a microscopic examination can be accepted as well established. These were shown to be of the usual type of carcinoma of the intestines. In 2 cases the growth had penetrated the abdominal walls, appearing externally as large crater-like ulcers with thick irregular margins. In Thiersch's case, reported by Bejer, the extension had taken place along a sinus which had persisted for 3½ years after the opening of a large pus-sac in the right iliac fossa. On partly removing the external mass a finger-thick cord was disclosed which extended down into the peritoneal cavity. This proved to be the vermiform appendix, and in the cecum a tumor the size of a walnut could be felt surrounding the orifice of the appendix. The writer calls especial attention to the early formation of adhesions and infiltration of the abdominal wall and to the absence of intestinal symptoms. He is of the opinion that the growth began in the apex of the appendix and slowly extended along the mucosa to the cecum. In the case described by Kolaczeck the right lumbar region presented a deep ulceration, at the base of which was the denuded os ilii. At autopsy the appendix was found to be destroyed by a tumor which had invaded the walls of the cecum, and also the surrounding cellular tissue and the psoas muscle. Morse and Daumic report a case occurring in a woman 50 years old who had died of heart-disease. The vermiform appendix floated free in the peritoneal cavity, was 4 centimeters long, 4.5 centimeters in circumference, and cylindric in shape. On transverse section the muscular layers could be

[1] Bull. Johns Hopkins Hosp., July-Aug., 1900.

PLATE 5.

Large multilocular ovarian tumor (Baldwin, in Brit. Med. Jour., July 14, 1900).

seen inclosing a hard mass, within which was a narrow canal opening into the cecum. The tumor did not project at all into the cecum and was limited to the appendix. Histologic examination showed the muscular coats for the most part normal, but in places separated by small islands of epithelial cells. The peritoneal coat was normal. In the central part of the tumor near the canal were seen remains of the mucosa and of Lieberkühn's glands. The latter had for the most part undergone cancerous transformation and were probably the origin of the neoplasm. No other growth was found. [Carcinomas occurring in the vermiform appendix are of the two varieties commonly observed in growths affecting the alimentary canal, namely, colloid carcinoma and adenocarcinoma with glands resembling proliferating glands of Lieberkühn. An unusually large proportion of the cases occurring in the appendix, if we accept the diagnosis made from the gross specimen, are of the colloid type.]

Ovarian Cystoma.—F. A. Baldwin [1] reports a fatal case of multilocular ovarian cyst in which the accumulation of fluid was immense. (See Plate 5.) One hundred and fourteen pints were removed after death, the fluid being of a red-brown coffee color, and fairly clear, but with colloid masses adherent to the inner surface of the cyst-wall. A second cyst contained 28½ pints of fluid, while two smaller cysts sprang from the root of the large cysts, each about the size of a cocoanut. The total amount of fluid was 18 gallons, and the weight of the tumor was 185½ pounds.

Uffenheimer [2] concludes a paper on **papillary cyst of the ovary,** as follows: Papillary cysts develop from germinal epithelium by a primary outgrowth of the latter in the form of pouches, the first development being purely epithelial. It has not yet been proved that papillary cysts can develop from the epithelium lining follicles. The sudden appearance of ciliated epithelium in these cysts is in consequence of a metaplasia, which is readily understood by reference to ordinary embryologic facts. Papillary outgrowths may grow spontaneously in superficial cysts, or may break through their walls and extend to surrounding tissues. Normal ova may be found in follicles whose walls are partially destroyed. Psammomas are found in the early stages of papilloma, and hyaline degeneration of the vessels is present.

Origin of Unilocular Ovarian Cysts.—Von Kahlden [3] takes a new view of so-called hydrops folliculi, believing that the unilocular cysts usually regarded as simple retention follicular cysts really develop from included peritoneal epithelium. He thinks that the ova often found in these cysts represent both the product of degenerated epithelial cells and new cell-growths which spring from the lining membrane. The question as to whether papillary cysts develop from ingrowths of ciliated epithelia he regards as still undecided.

Jeff. Miller [4] describes a case of **double intraligamentous cyst,** and

[1] Brit. Med. Jour., July 14, 1900. [2] Canad. Pract. and Rev., Feb., 1900.
[3] Ziegler's Beitr. z. path. Anat., 1901, Bd. XXVII, H. 1.
[4] New Orl. M. and S. Jour., Nov., 1900.

says that as a working rule it may be safely stated that in many cases in which intraligamentary growths are suspected it will be best first to secure the uterine artery or arteries through the vaginal vault before opening the abdomen. If cysts of considerable size are found occupying both broad ligaments and intimately connected with surrounding structures, hysterectomy as a routine measure will yield the most satisfactory results. If sepsis is present,—*e. g.*, badly-adherent pus-tubes, or an infected cyst-sac,—drainage is of utmost importance, and is best obtained through the vagina by removing the uterus, unless very good reasons exist for retaining that organ. Drainage is oftener indicated than in other pelvic conditions, owing to the extensive raw surfaces produced during the enucleation of the growth and the notable tendency of these growths to become infected.

Torsion of the Ovarian Pedicle.—A Doran [1] says tumors of irregular form are very liable to become twisted, especially when the pedicle is short. Where there are two tumors one may cause the other to rotate. When a big cyst is tapped, it often produces a torsion of the pedicle as it empties, but this should not be registered among torsion cases. Dermoids especially tend to rotate on their pedicles, partly because they are irregular in form, and partly because they are often overweighted at one point by masses of bone or other heavy substances. The contraction of the abdominal muscles is more apt to cause rotation of a tumor than intestinal peristalsis or the passage of scybala, although authorities are still divided on this subject. Sonnenfeld [2] found marked torsion of the pedicle in 50 out of 323 cases of ovarian cystoma (15 %). No cases are included in which there was not obstruction of the circulation or torsion to 180° and more. Dermoids seemed to predominate. In 2 cases the uterus was twisted about its long axis to 180°.

Abdominal Hysterectomy for Cysts and Solid Growths of the Ovary.—Quenu and Longuet [3] report 9 cases in which total abdominal castration was successfully performed in the treatment of ovarian disease. Removal of the uterus, together with its appendages, is held by the authors to be a legitimate operation in certain cases of morbid growths of the latter organs, and it is pointed out that according to the results hitherto attained such treatment is free from very serious risk, the mortality not being augmented by the association of hysterectomy with extirpation of the ovaries. Total abdominal castration practised in cases of morbid growths of the appendages presents, in the authors' opinion, great technical advantages, such, for instance, as the possibility of removing ovarian cysts that are bound down by extensive pelvic adhesions, the facility in obtaining a free pedicle, and, above all, the feasibility of effecting a very satisfactory autoplastic restoration of the floor of the pelvis. It affords security against postoperative accidents, especially intestinal occlusion. In addition to these advantages, hysterectomy for tumor of the appendages alone affords in some cases any prospect of radical cure. This operative method of dealing with disease

[1] Brit. Med. Jour., July 14, 1900. [2] Centralbl. f. Gynäk., 1901, No. 48.
[3] Rev. de Chir., July, 1900.

of the ovaries is indicated by the following conditions : (1) Ovarian cysts and tumors complicated by inflammatory uterine, periuterine, and tubal lesions ; (2) ovarian tumors and cysts associated with neoplastic degeneration of the uterus, whether such degeneration be independent of the ovarian disease or the result of the extension of this disease to the uterine parenchyma ; (3) in cases of bilateral cysts and tumors of the ovary in which hemostasis is rendered difficult by the enlargement and friability of the pedicle. The contraindications of the operations are : (1) A unilateral cyst in a young woman ; (2) when with bilateral ovarian disease the uterus is healthy and the pedicle is capable of being readily secured ; (3) when the pedicle can de rendered freely accessible by a more simple procedure.

Dermoid Cysts.—Emmanuel,[1] from microscopic studies of a minute dermoid found in the center of a small cyst of the ovary, arrived at the conclusion that it developed from an ovum, which was borne out by the fact that it contained cell-elements from the three layers.

Dermoid Tumor of the Pelvic Connective Tissue.—Beyea [2] adds to literature a case of this rare disease, with a good summary of earlier reports. Sänger in 1890 first showed that a tumor may develop primarily in the subperitoneal connective tissue independently of the ovary. De Querwain proved this theory by the report of a case occurring in a man. Beyea's patient was a colored woman, aged 38. Both uterine appendages had been removed when she was 26. Since that operation the period had never been seen again. Six weeks before she came under Beyea's observation she began to suffer from backache and tenderness in the right iliac fossa. There was also a hernia of the old operation-wound. A tender cystic tumor projected above the right groin, halfway to the umbilicus, and extended downward into the right fornix, displacing the small atrophied uterus to the left. Beyea operated and found that the tumor completely separated the layers of the right broad ligament. It was enucleated, the bleeding from the cavity was not uncontrollable, but with the uterus unavoidably wounded it was otherwise, so that organ was removed. Convalescence was uncomplicated. The tumor was a bilocular cyst, and 4 inches in diameter. Its loculi contained yellow liquid grease, which solidified on cooling ; its inner wall bore skin, rudimentary mammary and sebaceous glandular tissue, bone, cartilage, a little hair, and much fat. There were no indications of remaining ovarian tissue ; the surfaces of both ligaments close to the uterine cornua were smooth and normal.

[1] Zeit. f. Geburtsh. u. Gynäk., Bd. XIII. [2] Am. Jour. of Obstet., Apr., 1900.

ORTHOPEDIC SURGERY.

By VIRGIL P. GIBNEY, M.D., and J. HILTON WATERMAN, M.D.,
of New York.

Congenital Dislocation of the Shoulder.—J. L. Porter,[1] in an article on this subject, states his conclusions as follows: (1) It is of fundamental importance to discriminate between traumatic and developmental cases. (2) The pathology of the congenital cases is not sufficiently known to indicate the most promising line of treatment. (3) Sufficient operations have not been done to establish a successful method of operative treatment or add much to our pathologic knowledge. (4) In cases determined to be developmental by the history and measurements, remembering the probable deficiency of development of the one or both articular surfaces, an early operation, before the humeral head has formed a new articular facet under the spine and has itself become deformed, offers the best results.

Congenital Dislocation of the Shoulder Posteriorly, with Report of Two Cases.—D. W. Marston [2] reviews the greater part of the literature. After reporting 2 cases, which are illustrated by photographs, the writer, concluding, states that it is of the utmost importance to distinguish between cases of dislocation and true obstetric paralysis. The prognosis of the operative treatment is excellent. The earlier the operation, the more hopeful the outlook. Like congenital dislocation of the hip, these cases of the shoulder are little benefited by mechanical treatment.

Epicondylar Fracture of the Elbow.—Homer Gibney,[3] at the January meeting of the New York Academy of Medicine, presented a small boy who had sustained a fracture of the elbow 3 months previously. When the child was first seen, the elbow was fixed at an angle of 105 degrees with but little movement. The joint was cut down upon by V. P. Gibney, and the detached fragment sutured into place with kangaroo-tendon. The result obtained was excellent.

Congenital Deformity of Wrist; Osteotomy of Radius.—De Forest Willard [4] reports a case illustrating this exceedingly rare condition. An osteotomy of the radius 1½ inches above the wrist-joint, with forcible straightening and fixation for weeks in a corrected position in plaster-of-paris, gave a greatly improved result, both as to

[1] N. Y. Med. Jour., Aug. 18, 1900.
[2] N. Y. Med. Jour., Mar. 16, 1901.
[3] Phila. Med. Jour., Feb. 16, 1901.
[4] Am. Med., Apr. 20, 1901.

appearance and strength. While the carpus is still out of its proper relation with the ulna, the obliteration of the curve of the radius has brought the hand into much better line with the arm.

Sudden Death at the Beginning of the Application of a Plaster-of-paris Corset for Spinal Disease.—M. Auffret [1] reports a case in which death occurred as the first turn of the bandage was applied. The autopsy revealed pus in the mediastinum, which was found to come from a prevertebral abscess that would hold about half a liter. The sudden calamity is attributable to the rupture of the abscess. This could hardly be referred to the suspension, which was of minimum degree. The child, however, struggled a great deal, and to one of these sudden movements the accident is referable.

Congenital Lateral Curvature of the Spine.—H. L. Taylor[2] has observed 2 cases in infants under 1 year of age. In one he thought the cause to be due to some malposition *in utero*. He regards the prognosis in the congenital and early rachitic cases as serious; if untreated, the deformity usually increases, and many become very severe. He advises manual correction employed several times a day, and, if necessary, strapping the child on a frame. Eulenberg found 5 cases out of 1000 under 1 year of age.

Alteration of the Internal Organs in Scoliosis and Kyphosis.—Bradford and Cotton [3] state that Bachmann has thoroughly investigated this subject. A transverse position of the heart and an unusual position of the thoracic and abdominal organs, with the separation of the esophagus from the aorta, were noted in a number of cases. The cause of death in kyphoscoliosis is chiefly heart-failure, and congestive bronchitis with hypostatic pneumonia, and hypertrophy of the heart is common.

Orthopedic Corsets in Scoliosis.—Bradford and Cotton, [4] in a review of the literature, state that Hussey claims that any corset is a disadvantage and increases the tendency to rotation and side deviation. Vulpius and Schang oppose this view. Schang advises forcible correction in some cases, this correction being carried out for 4 weeks; after this, massage. [The authors believe that all corsets are not a disadvantage, and do not increase the tendency to rotation and side deviation. It is quite a common practice with many orthopedic surgeons to employ heavily laced corsets. From our experience not only deviation, but rotation is to some extent prevented if the appliance is properly applied, and with a view to correction while it is being applied.]

Hyperextension as an Essential in the Correction of the Deformity of Pott's Disease, with the Presentation of Original Methods.—R. T. Taylor,[5] at the fourteenth annual meeting of the American Orthopedic Association, presented a paper on this subject, with some excellent illustrations. He concludes that jackets applied after the method described fix the spine in the most advantageous position for lessening the tendency to deformity. This method is applicable to mid

[1] Rev. d'Orthop., Nov. 1, 1900.
[2] Practitioner, Sept., 1900.
[3] Boston M. and S. Jour., Jan. 31, 1901.
[4] Boston M. and S. Jour., Jan. 31, 1901.
[5] Johns Hopkins Hosp. Bull., Jan., 1901.

and lower dorsal and lumbar caries. Above the sixth dorsal, a steel back brace with head support must be used. Aside from the danger of exercise and unequal force being used manually by several persons making traction for "forcible correction" under an anesthetic, these methods enable one operator to adjust to a nicety his pressure and traction without an anesthetic, and further enable him to make his diagnosis as to the pathologic stage the disease has reached, which the size of the deformity does not always tell, in regard to the degree of ankylosis.

Fatal Case of Abscess in Cervicodorsal Pott's Disease.—V. P. Gibney,[1] at a meeting of the Orthopedic Section of the New York Academy of Medicine, exhibited a specimen from a patient afflicted with Pott's disease with deformity. After describing the operation in detail, the writer reported the autopsy. In conclusion he stated that he had seen no less than 6 children die unexpectedly in the night with abscess arising in this location from carious vertebræ. Autopsies had not made clear the cause of death.

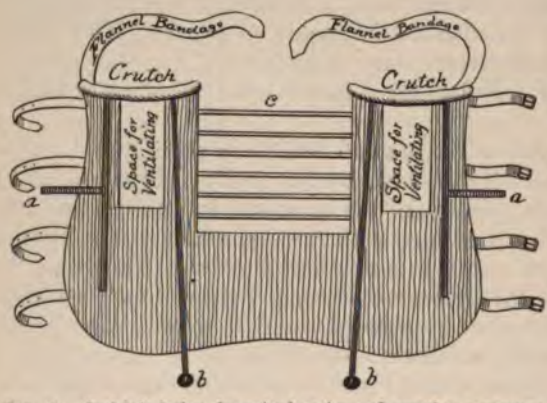


Fig. 99.—Gaskin's jacket for spinal caries and angular curvature.

Rigidity of the Spine.—J. H. McBride[2] reports 2 cases. One was that of a soldier who was not wounded, no history of syphilis or hereditary disease. Ten years later his spine became stiff, the hip-joints were almost immovable, and the knees were bent in. Later, lateral dorsal curvature of the spine developed. The other patient's condition was considered as being due to a hypertrophic cervical pachymeningitis following trauma.

The Combination of a Plaster-of-paris Jacket with a Brace to Correct and Retain Correction of the Kyphosis of Pott's Disease of the Spine.—A. Mackenzie Forbes[3] describes in detail the appliance which he has used for this purpose. The author claims that: (1) It possesses a greater and surer leverage than either a jacket or a brace alone; (2) the combination is preferable for patients suffering from low Pott's disease, as a jacket is universally acknowledged to control these cases but slightly, and it is certainly surer than a brace which is generally employed in such disease. In patients suffering from general paralysis, or paresis, in whom the surgeon desires spinal immobilization and extension as well as recumbency, this appliance is naturally prefer-

[1] Med. News, Jan. 26, 1901. [2] Jour. of Nerv. and Ment. Dis., Nov. 17, 1900.
[3] N. Y. Med. Jour., Dec. 22, 1900.

able to a jacket alone, especially when it is remembered that the straightening of the kyphos has often resulted in immediate improvement.

Jacket for Spinal Caries and Angular Curvature. — T. L. Gaskin [1] presents a new apparatus for this purpose, which is shown in figure 99. The advantages claimed for it are: (1) The arm rests enable the weight of the upper part of the body to be swung through the shoulder from the elbows; (2) the posterior uprights resting on the seat give real support and are of special service; (3) clean, cool, and efficient, and is easily made.

Caries of the Spine; an Analysis of 1000 Cases.—J. H. Waterman and C. H. Jaeger,[2] at the annual meeting of the American Orthopedic Association, presented the results of an analysis of this number of cases taken from the records of the Hospital for the Ruptured and Crippled. The cases were arranged in groups according to age. The following points are considered: The frequency with which spondylitis is present in male or female; the first symptom or symptoms which called the attention of the family to the existence of the disease; and the deformity with reference to its degree, the cause where it could be ascertained, as well as the family antecedents, the occurrence of abscesses during the course of the disease, and the presence of paraplégia and of tuberculous complications.

Operation for Ununited Intracapsular Fracture of the Neck of the Femur.—G. G. Davis [3] records 2 cases. Fixation of the fragments was secured differently in each case. In one, the surfaces of the fragments (freshened by gouge and curet) being brought together by assistants, making extension and counterextension, two stout steel pins were driven through the upper end of the femur on into the neck and head. In the other case the fragments were fixed by driving in ivory pegs. The pegs were 2½ inches long. [We regret that the final result has not been given.]

Congenital Dislocation of the Hip.—Bradford [4] states that the collected experience of the operative treatment of congenital dislocation has demonstrated the following: In many cases successful reduction of the dislocation has been performed. Frequently, however, relapse has occurred after apparently successful reduction. Relapse is more frequent after operation with incision. Operative treatment with or without incision lacks precision. After describing in detail the usual operative procedure employed, the writer reports in a general way the personal results obtained in 34 cases.

An Unusual Case of Meralgia Paræsthetica, with Intermittent Lameness (Intermittent Claudication, Type Charcot).—A. Gordon [5] reports an atypical case, presenting many interesting features. Besides the anterior branch of the external cutaneous nerve being affected, the posterior is also, in which one or two cutaneous branches of the anterior crural nerve are involved, and to which there is added a new phenome-

[1] Lancet, Apr. 13, 1901.
[2] N. Y. Med. Jour., Nov. 9, 1901.
[3] Practitioner, Apr., 1901.
[4] Boston M. and S. Jour., Oct. 25, 1900.
[5] N. Y. Med. Jour., Nov. 10, 1900.

non called intermittent lameness. In this case the lameness is clinically the exact reproduction of Charcot's type, but the etiologic factor is different. Of the remedies used, potassium iodid and daily massage seemed to have the best effect. Surgical intervention, although insisted upon, was declined by the patient.

Coxa Vara.—Painter [1] reports the case of a boy aged 15. One year before he sprained his left thigh and knee, which resulted in synovitis of the knee and painful sensation of strain of the anterior thigh muscles. On physical examination some time later the left leg was found to be 1 inch shorter than the right, 1 inch atrophy of the thigh, and flexion to a right angle without spasm. Flexion beyond a right angle is accompanied only with abduction. The diagnosis was corroborated by the x-ray. W. E. Bennett,[2] in an article on this subject, reviews in part the literature, describes a certain classification, and reports some cases which he has observed. The author calls special attention to the differential diagnosis of the condition in its early stage.

Retardation of Growth as a Cause of Shortening After Coxitis.—H. L. Taylor,[3] at the annual meeting of the American Orthopedic Association in May, 1900, presented an extremely interesting study on this subject, the result of personal investigation in a number of cases. The writer's conclusions are: (1) Considerable retardation of growth, both in the length and thickness of the limb and its component bones, is the rule after coxitis and other affections causing long periods of lameness or disability in childhood. (2) The amount of retardation appears to bear a distinct relation to the amount and duration of the restraint or disability. (3) This inhibitory effect of restraint should be considered in selecting treatment for disabling affections of the lower limbs. Other things being equal, locomotion is desirable, and restraint for long periods harmful, although complete or partial interference with function must often be enforced as the least of evils.

Permanent Congenital Dislocation of the Patella.—McLaren [4] reports a case upon which he had operated. A U-shaped incision was made over the knee and a flap of skin turned up. The expansion of the quadriceps tendon and the capsule were divided (without opening the joint) on the outer side of the knee. Two holes were bored through the inner edge of the patella, which was stitched to the internal lateral ligament with stout catgut. There was union by first intention, but the ligature not holding long enough, an operation 8 weeks subsequently, with silk being used, was successful.

Cases of Hemarthrosis of the Knees.—R. A. Hibbs,[5] at a meeting of the Orthopedic Section of the New York Academy of Medicine, showed 2 cases. Two hemophiliac brothers died in infancy. These attacks have been recurring at frequent intervals for several years, leaving the joints so painful that walking is difficult or impossible for a few days afterward, and sufficient time had not elapsed

[1] Ann. of Gynec. and Ped., July, 1900.
[2] Birmingh. Med. Rev., Dec., 1900.
[3] Phila. Med. Jour., Jan. 26, 1901.
[4] Post-Graduate, Oct., 1900.
[5] N. Y. Med. Jour., Jan., 1901.

between the attacks to allow the effusion to disappear. Thus, there is a constant condition of chronic synovitis. It is evident from the histories that these attacks of synovitis are due to hemorrhage into the joints, and that they illustrate a comparatively rare form of joint-lesion.

Severe Genu Valgum Treated by Cuneiform Osteotomy.—L. Grounauer [1] reports a case, showing the photograph before and after operation. The patient was 9 years old and the deformity began at 2. The base of the wedge of bone which was removed measured 1.5 centimeters. Four weeks after the operation the patient could walk without support. [The tendency of orthopedic surgeons is to simplify the operation, inas-

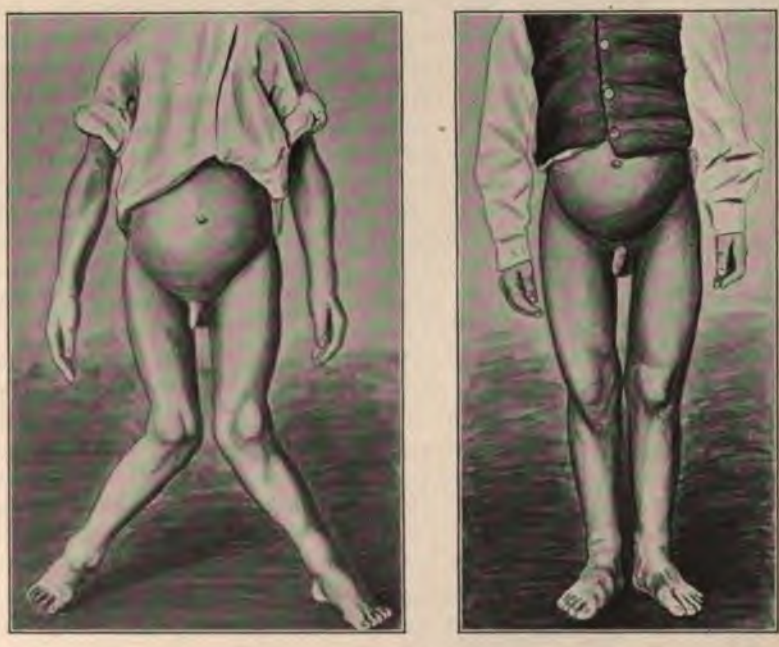


Fig. 100.—Grounauer's case of genu valgum treated by cuneiform osteotomy, before and after operation (Practitioner, Apr., 1901).

much as good results may be obtained by simple osteotomy. By McCormick's modification of McEwen's operation a wedge-shaped opening is made on outer side of lower end of femur, thus inducing lengthening rather than shortening of the limb. Cuneiform osteotomy adds an element of danger to the operation.]

Tuberculous Osteitis of Patella.—Bradford and Cotton [2] state that Goss reports 4 cases. Symptoms are spontaneous pain day and night, pain on pressure, unevenness of surface of bone, movements little interfered with unless the joint is invaded. The pathognomonic symptom is a prepatellar abscess of slow formation, much less mobile than the bursa.

[1] Practitioner, Apr., 1901.

[2] Boston M. and S. Jour., Jan. 31, 1901.

Treatment of Genu Valgum.—E. M. Little [1] describes a method of attaching the brace in the shoe. The author states that the pocket on the boot fulfils an important office in the ambulatory treatment. It is formed by a piece of leather sewed on to the outer side of the upper boot, and secures and protects the lower end of the long splint, and prevents its displacement forward. [We do not see any advantage over the method more commonly used.]

Phelps' Operation for Clubfeet, with a Report of 1650 Operations.—A. M. Phelps,[2] in a paper read before the British Medical Association, August, 1900, gives the following reasons for performing this operation: (1) There is no mortality attending it. (2) Any feet at any age can be straightened. (3) The results from the operation are as good as or better than that from any bone operation or mechanical treatment whatever. In the series of 538 cases he finds that the relapses amount to 6%. These were entirely due to negligence upon the part of the patient or parent. The plan of treatment which the author follows is in the order enumerated: (1) Manual manipulation and fixation; (2) subcutaneous osteotomy; (3) open incision; (4) linear osteotomy through the neck of the astragalus; (5) cuneiform resection from the body of the os calcis; (6) Pirogoff's amputation. [Relapses cannot alone be attributed to negligence on the part of the patient or parent. The responsibility lies with the surgeon.]

Fig. 101.—Little's method of attaching brace to shoe.

The Pathogenesis of Flatfoot in Cases of Varicose Veins.—Eriberto Aievoli [3] holds that it is a result of the varicose condition, the cause being found in the nutritive disturbance induced by the perturbed circulation in the power and resistance of the plantar arch, and in the disturbed mechanism of the lower limb, flatfoot representing functional adaptation.

Celluloid as Material for Flatfoot Supports.—A. Freiburg [4] states that the use of this material was first suggested by Kirsch. The advantages claimed are lightness, the absence of any tendency to cor-

[1] Brit. Med. Jour., Apr. 13, 1901.
[2] Am. Med., Apr. 6, 1901.
[3] Med. Rec., Oct. 6, 1900.
[4] Boston M. and S. Jour., Nov. 8, 1900.

rode, and the ease with which the plates can be made noninjurious to foot wear.

Clubfoot.—H. N. Berg,[1] at the February meeting of the New York Academy of Medicine, presented a paper on the etiology. The subject of the evening's discussion was a symposium on this condition. He stated that talipes equinovarus was a morphologic stage in the normal development of the lower extremity of every human fetus. The writer then gave his explanation of how it is produced. J. E. Kelly dealt with the mechanism of the foot. E. D. Fisher, in speaking of the neurologic aspect of talipes, said that the only class of talipes interesting to the neurologist was that class originating from lesions of the brain, spinal cord, or peripheral nervous system. N. M. Shaffer spoke of the nonoperative treatment. He divided his clubfoot patients into three classes, vertical, anteroposterior, and transverse. A. M. Phelps spoke of the operative treatment. He believed all cases should be divided into classes according to age and deformity.

Simple and Efficient Treatment of Talipes Calcaneus Paralyticus in Young Children.—V. P. Gibney,[2] at the annual meeting of the American Orthopedic Association, read a paper reporting a number of cases, and described the method which he commonly used in treating these cases. In one instance the feet were held in complete extension for 1½ years by plaster-of-paris, being changed at frequent intervals. In conclusion the writer stated that almost any appliance which is worn night and day, the management of which is taken completely out of the patient's hands, should bring about like results.

New Treatment of Tuberculous Osteoarthritis.—C. Trunecek [3] uses a fluid consisting of a 20% to 25% solution of salts, observing certain proportions. This fluid is injected into the fistula through a tube, at first gently, and then with great force the opening plugged around the tube, and the wound then protected with vaselin. The injection is continued until the fluid emerges clear and slightly tinged with blood. The cavities are then injected with 10% iodoform ether, compresses are applied to reduce the inflammation, and the patient is left in bed. In one case of multiple tuberculous caries in the humerus of an adult, a large piece of necrosed bone was eliminated the third day after the injection.

Funnel Chest.—A. B. Judson,[4] before the Orthopedic Section of the New York Academy of Medicine, presented a man, aged 71, having a deformity which, although rare, has been described by a number of observers. From an angular projection at the junction of the manubrium and the gladiolus there was a continuous depression till the deepest place was reached at the lower end of the xiphoid appendix. The front of the chest was practically normal except for this funnel-like depression, which began on each side at the nipple line and was cup-shaped at the bottom with a depth of 1½ inches, unchanged by expiration or inspiration.

[1] Phila. Med. Jour., Mar. 23, 1901.
[2] Med. News, Sept. 15, 1900.
[3] La Semaine Méd., July, 1900.
[4] Phila. Med. Jour., Apr. 20, 1901.

The Treatment of Rheumatic and Allied Diseases of Joints Complicated by Deformity.—V. P. Gibney [1] read a paper before the Practitioners' Society, and reported 18 cases coming under his observation. He concludes that it is difficult to fix upon any one form of treatment that has yielded the best result, but he commends the forcible breaking up of adhesions when inflammatory conditions have subsided, a frequent recurrence to these operations, and the discriminate use of plaster-of-paris. His belief in the efficacy of absolute immobilization as a promotion of absorption of chronic inflammatory products grows stronger year by year. The protection of joints with a limited range of motion, by apparatus within the bounds of this motion, is also to be commended. There is scarcely any joint in the body but that will tolerate a great amount of force at certain times. Only recently he attempted the correction of a deformity in a rigid spine, by extension, with moderate force, and the result at the present writing is gratifying, to say the least. The apparatus employed is that used in the correction of the boss of the deformity in Pott's disease, and is employed without an anesthetic. In a few instances he has recommended an anesthetic. To sum up in a word the treatment which has been most efficient would be as follows: A judicious management of the case throughout, correction of the deformity, partial restoration of function, which renders the patient helpful; and improvement is sure to follow. [A very interesting article on this subject has been published by J. E. Goldthwait, of Boston.]

Pneumatic Perineal Straps.—T. H. Myers,[2] at a meeting of the Orthopedic Section of the New York Academy of Medicine, exhibited rubber tubes 10 inches long and 1¼ inches in diameter, designed to take the place of the ordinary perineal straps. He stated that they were particularly comfortable for older children and adults whose weight made perineal support difficult.

Observations on Rapid Osteoclasis for the Correction of Rachitic Deformities.—W. Blanchard,[3] at the annual meeting of the American Orthopedic Association, reports his results in 262 cases operated by this method, not a single case presenting any injury, without anything but a simple fracture or bend, and without a single delayed union, and, so far as known, without an epiphyseal separation. The compression time in the osteoclast in no case exceeded 8 seconds. The author claims that among the undeniable advantages of rapid osteoclasis over osteotomy is the freedom from the dangers attending bloody operations, and the lengthening instead of shortening of the legs of the frequently already dwarfed.

The Relation of Deformities to Life-expectancy.—J. L. Porter,[4] in an interesting paper, states that he finds statistics pertaining to this subject to be entirely lacking. In conclusion the writer states that nearly all the deformities considered add an increased risk to life; they are below par or under the average, and should be so classed in issuing

[1] Med. Rec., Mar. 2, 1901.
[2] Phila. Med. Jour., Jan. 26, 1901.
[3] Chicago Med. Recorder, June, 1901.
[4] Med. Exam. and Pract., Feb., 1901.

insurance; that the action of the insurance companies in these cases must depend, first, upon the degree with which the deformity interferes with the maintenance and protection of health and life, and second, upon the indication which the deformity may furnish of a constitutional disease that is liable to recur or may at any future time affect the general health.

Congenital Elephantiasis.—Bradford and Cotton [1] call attention to a case reported by Froelich, of marked hypertrophy of the left leg, with a tumor of the dorsum of the foot and a second on the front of the lower leg. Elsewhere all the cellular tissue thickened and enlarged. A like condition existed on the other leg, but less marked. The author thinks the condition a lymphangiomatous one, due to the circular constrictions. In this review it is recalled that Kermisson reported an interesting case of combination of congenital deformities of the supposed amniotic series.

Fig. 102.—Wilkinson's case of myositis ossificans (Quart. Med. Jour., Nov., 1900).

Myositis Ossificans Progressiva. — G. Wilkinson [2] reports a case illustrating this condition. The lower jaw is undershut, and the mouth can be opened about a quarter of an inch. This limitation of movement appears to be due to the temporal muscles. The largest and most striking bony mass spreads over the back from immediately to the right of the lowest lumbar vertebra. There are two large bony bosses in the outer border of the right latissimus dorsi muscle, connected by a bony plate. There is a nodule of bone in the left pectoralis major at its origin from the fourth rib, and many other numerous deposits are found in other parts of the body. Neither injury nor rheumatism can be regarded as more than a slight predisposing cause in certain cases. Perhaps the most generally accepted view of the pathology of the disease is that advanced by Pincus, who believes it to be a newgrowth, and compares it to multiple fibroma. The illustration shows the condition.

[1] Boston M. and S. Jour., Feb. 14, 1901. [2] Quart. Med. Jour., Nov., 1900.

Causes of Subcutaneous Rupture of Tendons.—Vulpius [1] has seen a number of cases showing a rupture of the tendons, among them one in the extensors of the forearm, one in the extensors of the leg. These cases were caused by blunt pressure, and entailed serious nutritive changes in the limbs concerned. In another case the writer thinks the cause due to fatty degeneration of the muscle.

Congenital Absence of Bone.—L. Weigel,[2] at the January meeting of the Orthopedic Section of the New York Academy of Medicine, presented a series of radiographs showing congenital absence of bones in members of the same family. The mother had no thumb and gave a history of having borne 12 children, 4 of whom were deformed. The mother attributed her own deficiency to maternal impression, stating that her mother while pregnant was shocked by seeing a man without a thumb.

Congenital Malformations of the Upper Extremity.—C. Beck,[3] in an article on this subject, calls attention to the great scientific and practical value of the Röntgen rays in the study of congenital malformations of the bones. Skiagraphy of the extremities especially has given more valuable information than dissection. The article contains some excellent radiographs, and some interesting cases of congenital malformations are reported.

[1] Münch. med. Woch., Apr. 24, 1900. [2] Med. News, Mar. 9, 1901.
[3] N. Y. Med. Jour., June 29, 1901.

OPHTHALMOLOGY.

By HOWARD FORDE HANSELL, M.D., and WENDELL REBER, M.D.,
of PHILADELPHIA.

REFRACTION.

General Considerations.—H. Pagenstecher [1] defines asthenopia as impaired ocular efficiency due to either refractive or muscular anomalies or to conjunctival affections and neurasthenia. Admitting the importance of proper corrections in suitable cases, he asserts that by far the majority of refraction anomalies do not lead to asthenopia, and warns against expecting too much of glasses, urging that they should be the last resort. His skepticism as to the results obtained in America and England from the use of cylinders is little short of irony. According to his views, we are making our hypermetropes prematurely presbyopic and we are sinning against our myopes in giving them glasses for constant wear. Muscular asthenopia, pure and simple, he pronounces exceedingly rare, and tenotomy in such conditions he evidently looks upon as a high crime and misdemeanor. [All of this is intensely interesting as illustrating the attitude of one of the most prominent German ophthalmologists toward the most far-reaching ophthalmic discovery of the century. The doctrine of prevention-by-refraction of much headache, asthenopia, and kindred ailments makes astonishingly slow advance in Germany. This is the more surprising as it is a country so wholly devoted to science in almost every direction. Perhaps the foregoing abstracts explain this in part, for if such minds as Pagenstecher adhere to the old ideas, there is no hope for thoroughgoing refraction and muscular work in Germany until their young men break through their ophthalmic traditions. It is pathetic to see the acceptance of such a glorious truth hampered by the very men who should be proclaiming it from the housetops.] In Mexico, in striking contrast to what Pagenstecher is doing in Germany, Troncoso [2] finds they are gradually overcoming the prejudice against the use of glasses. He makes an admirable suggestion, namely, the separation, in schools, of children with normal vision from those who have some visual defect other than ametropia. C. A. Wood [3] believes he is well within the bounds when he places the ocular element of mixed headaches at 40%, and feels certain that fully 80% of all frontal headaches are bound up with ocular

[1] Zeit. f. Augenh., May, 1901. [2] Anales de Oftal., Jan., 1901.
[3] Med. News, July 28, 1900.

anomalies. The site of ocular headache is, in order of frequency, (1) supraorbital, (2) deep orbital, (3) frontooccipital, (4) temporal. The forms of headache that are most likely to simulate ocular headache are the supraorbital or supranasal nasal pain of nasal disease, supraorbital malarial neuralgia, and the so-called nervous headache. According to L. Howe,[1] asthenopia is more frequent in this country than abroad, which he attributes to the prevalent carelessness in the use of the eyes, overstrain in business, indigestion, etc. He also finds that a larger number of persons are relieved in this country. The American seeks relief in glasses earlier than do foreigners. The average American practitioner is better fitted to detect and meet the conditions, and American ophthalmologists and opticians are better supplied with diagnostic appliances and stock for such cases. E. G. Starr [2] asserts that many cases of what is commonly called "muscular rheumatism" in the back of the head and neck and radiating down between the shoulder blades are due to eye-strain, as this pain is found in about 80 % of all cases of refraction presenting for treatment. Confusion of ideas, lack of mental concentration, mental inaptitude in children are all, he says, more or less indicative of uncorrected eye-strain. At the regular meeting of the ophthalmic Section of the Buffalo Academy of Medicine, A. L. Benedict [3] contended that too much importance was attached to eye-strain as a causative factor in the production of abnormal conditions. He believes that gastric disturbances are usually at the bottom of those conditions laid at the door of eye-strain. In the discussion, C. G. Stockton could not at all agree with the position taken, as his experience proved conclusively that eye-strain is repeatedly the cause of pathologic states and many times induces disturbances of digestion which would produce the symptoms. A. A. Jones also differed with Benedict, claiming that while gastric reflex is an extremely important factor and may bear either the relation of cause or effect to eye-strain, the latter is often the primary cause. E. Starr, A. G. Bennett, and A. A. Hubbell said their experience in the correction of ametropia led them to the conclusion that eye-strain is often the sole cause of diverse pathologic conditions. H. N. Hoople [4] details 4 cases of asthenopia cured by removal of the middle turbinate body. The patients complained of symptoms referable only to the eyes, but were unrelieved by ocular corrections. He says it is probable that a large number of asthenopias of obscure origin are really secondary to some form of nasal obstruction. Sattler [5] recites 3 cases in which suppurative disease of the accessory cavities was entirely responsible for an asthenopia that disappeared when the primary trouble had been cured. H. Derby [6] thinks that probably glasses are worn too much in hypermetropia and too little in myopia. He holds that weak cylinders and prisms may be easily overdone—*i. e.*, may be ordered when wholly unnecessary.

[1] Buffalo Med. Jour., Sept., 1901.
[2] Jour. Am. Med. Assoc., July 7, 1900.
[3] Ann. Ophth., Jan., 1901.
[4] Med. News, Apr. 13, 1901.
[5] Jour. Am. Med. Assoc., May 18, 1901.
[6] Boston M. and S. Jour., Feb. 28, 1901.

Methods.—J. E. Weeks [1] discusses the disadvantages of binocular lenses and finds after experiments with various devices that the best results can be obtained by the use of a paster of oval shape which measures 10 millimeters in its vertical and 15 millimeters in its horizontal diameter, giving a field at the reading distance of approximately 7 inches in the horizontal and 5 inches in the vertical meridian. If the oval disc is placed 2 millimeters above the lower edge of the distance lens it will permit of clear distant vision below [this ought to be a tremendous advantage], sufficient to enable the wearer to see the curb, descend stairs, etc., without trouble. It is sufficient to place the optical centers of the reading portions of the lenses at the center of the paster. He decenters the reading pasters slightly inward. To the Snellen test-types and cards now in general use E. Landolt [2] objects that (1) they cannot be used for the illiterate; (2) some letters are much more easily recognized than others; (3) the recognition of letters is a more complicated process than might at first be thought. (4) His principal objection is that they do not answer to the definition of the acuteness of vision; vision, so measured, should be expressed as inversely proportional, not to the height of the letter, but to its square. To remedy these alleged deficiencies, Landolt uses as a test-object a black circle or ring the thickness of which equals one-fifth of its diameter. The circle is interrupted by a gap, which also equals in width the thickness of the

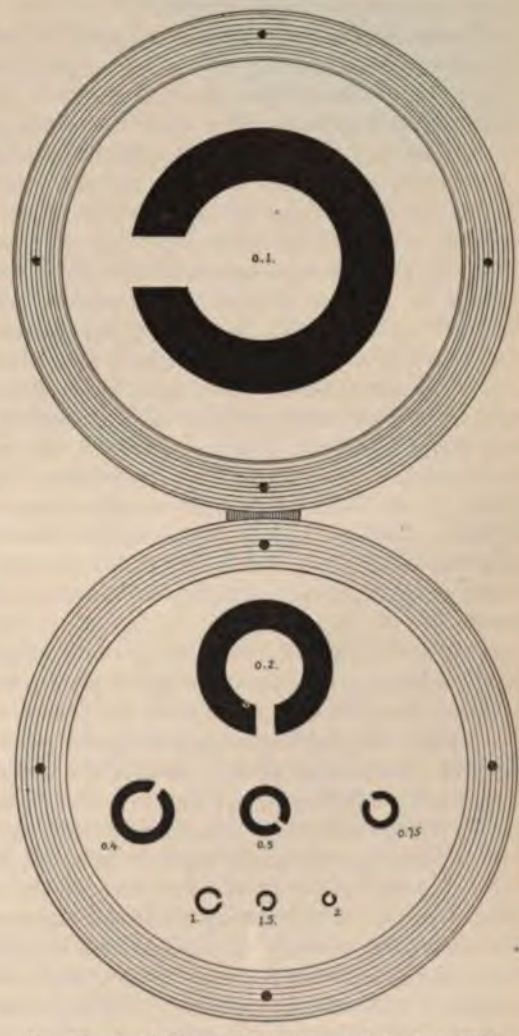


Fig. 103.—Landolt's test-objects (Ann. Ophth., Apr., 1901).

[1] N. Y. Med. Rec., Aug. 24, 1901.

[2] Ann. Ophth., Apr., 1901.

ring. (See Fig. 103.) The person examined is asked to indicate by word or sign the direction in which the circles are broken. "The great advantage of these test-objects," Landolt claims, "is that, being uniform and the same for the illiterate as for the educated of all nations, they represent a true unit, the essential and fundamental condition for every measure and examination."

Homatropin hydrobromate, says E. Jackson,[1] properly used, is a reliable and satisfactory cycloplegic, quite as sure to produce complete ciliary paralysis in children as in adults if applied in 2.5 % to 3 % solutions every 5 minutes for 5 or 6 instillations.

As to the **value of the ophthalmometer,** A. D. McConachie[2] observes that cylindric formulas should never be ordered from the ophthalmometric findings unless carefully proved by other and much more reliable tests, such as retinoscopy and the trial case. He has found that the total astigmatism, as found by trial glasses, and the corneal astigmatism as registered by ophthalmometers, will differ from 0.75 to 1.5 D. It is of especial value in aphakia, also when a mydriatic ought not be used, and in corneal and in vitreous opacities. However, retinoscopy is evidently the author's reliance, as he says that the amount and axis of astigmatism are more speedily and accurately obtained this way than by any other method. Unlike many other users of the ophthalmometer, he is convinced that accuracy in refraction requires a cycloplegic in the majority of cases. Aiken[3] describes a new ophthalmometer which he thinks offers practically as favorable results at less expense than the original expensive and bulky instruments. [Any portable ophthalmometer can prove nothing but a source of vexation of spirit to its owner.]

Astigmatism.—Any plan to cure astigmatism by perforating corneal incisions seems to A. Breuer[4] wholly unjustifiable. He bases this statement on his experience with the galvanocautery of 1 millimeter tip (dull red), with which he makes a small punctiform burn just inside the limbus penetrating about one-half of the corneal thickness. This is done under anesthesia, the spot to be burned being marked in some way while the patient gazes at a distant object to obviate torsion of the eyeball. The cauterization lasts from 2 to 3 seconds, and the effect, strangely enough, is in all cases exactly the reverse of what takes place after incision. Galvanocauterizations increase the refraction of the operated meridian while incision decreases it. He reports 5 cases in which the astigmatism was reduced from 1.00 to 4.00 D., doing away with the necessity of wearing cylinders. Similar results are claimed in 10 other cases. It is always necessary to produce a considerable overeffect, as much of the first result disappears in time, especially in children. The best results are obtained in compound hypermetropic astigmatism. [Unfortunately, none of his reported cases has been operated more than 3 months, so that much more time is necessary before a correct estimate of the value of this maneuver can be made.]

[1] Ann. Ophth., Jan., 1901.
[2] Ann. Ophth., Oct., 1900.
[3] N. Y. Med. Jour., Feb. 16, 1901.
[4] Lancet, June 1, 1901.

Myopia.—In an exhaustive paper on the prophylaxis of myopia Koenigshoefer [1] lays proper stress on the cultivation of a hygienic reading position, exercise, hours of work, suitable illumination, etc. Full corrections he never gives, laying down the advice that "the greater the myopia, so much greater must be the uncorrected part of the myopia." [It is hard to understand why our German brethren, who are usually so quick to grasp the scientific features of a problem, should so overlook two vital factors in myopia. The question of partial or full corrections in all myopes (save those of high degree) is closely bound up with the presence of esophoria or exophoria. In the former the patient is nearly always more comfortable with a partial correction, while in the latter full corrections are more readily borne. Moreover, there is not one word said by Koenigshoefer about the vital necessity of correcting every bit of astigmatism in all myopes. This we believe is the weightiest factor in many cases of progressive myopia.] Priestly Smith [2] states that no hard-and-fast line can be drawn between stationary and progressive myopia. He believes it prudent to suspect every youthful myopia of a tendency to increase until time has proved it to be stationary. He is doubly suspicious in the presence of choroidal congestion and atrophy and examines such cases at intervals of 6 to 12 months. In these views he is joined by H. Power, H. Eales, E. E. Maddox, and others. A. Darier [3] thought much could be accomplished in moderate myopia by ocular massage; just why or how he did not say. [Again not one word about astigmatism as provocative of increasing myopia.] In a study of 1000 myopes of over 6.00 D., J. Schlesinger [4] found that the percentage of eyes with opacities of the vitreous grows with the degree of myopia. Moreover, high myopia is of essential moment in the formation of cataract. Detachment of the retina occurred in 4.4% of the cases at an average of 43.3 years. In 9% disease of the macula was found. In 133 cases heredity was plainly operative. As a disadvantage of the operation for high myopia A. Osswold [5] (who was himself operated for high myopia) states that he has found several patients who, after operation, complained of diminution of sight under lessened illumination; also of erythropsia. Five years ago Panas exhibited a young student as an example of the fine results obtainable by removing the lens in high myopia. There were no lesions in the choroid. After operation he required only + 1.00 D. Six months later, progressive lesions appeared in the choroid, terminating in complete detachment of the retina and total blindness in both eyes. Panas [6] believes that similar results are more common than would be supposed from the published statistics. For these reasons, he has been particularly interested in an observation, related by Bettremieux (of Roubaix), of a lad of 14 with progressive myopia, 4.00 and 5.00 D., who was treated for 5 months with repeated instillations of pilocarpin

[1] Woch. f. Ther. u. Hyg. des Aug., No. 20, 1901.
[2] Brit. Med. Jour., Oct. 19, 1901.
[3] *Ibid.*
[4] Beitr. z. Augenh., No. 45.
[5] *Ibid.*
[6] Bull. de l'Acad. de Méd., May 1, 1901.

along with a pressure bandage at night. With no interruption in his studies, the myopia diminished with this simple treatment to 3.50 and 2.75 D., explainable by the decreased anteroposterior axis of the eyeball under the influence of the myotic and the compression. As to the amount of myopia corrected by removal of the crystalline lens, E. Jackson [1] says that for a given amount of myopia the effect of removal of the lens may vary 10.00 D. or more. Such a variation is too great and too common to be explained as mere inaccuracy of observation. While the general trend of the figures indicates that a lengthened anteroposterior axis is the most important cause of very high myopia, variations of corneal curvature or of lens-refraction, or of both, are factors of practical importance. We can never predict with exactness the effect of an operation until these are taken into account.

Conical Cornea.—H. Knapp [2] has used the galvanocautery in 14 cases of keratoconus with very satisfactory results. As a result of this experience he offers the following suggestions: (1) Never cauterize too deeply, and if the result of the first operation be imperfect, apply the convex disc electrode again to the place in which the greatest subsequent cicatricial contraction is desired. (2) Spare, if in any way possible, at least half of the pupillary area. If operation is done early one will have to do with a clear cornea, the reaction will be least, and the visual result, as well as the operative effect, greatest.

MUSCLES.

Physiology and Evolution of Binocular Vision.—In the case of a girl aged 10, on whom Guaita had successfully operated for congenital cataract, E. Trombetta [3] had the rare opportunity of studying the evolution of binocular vision, about which there has been such voluminous speculation. In 45 lessons he succeeded not only in teaching the child to see without the aid of the sense of touch, but in obtaining satisfactory binocular vision. He finds that definite establishment of binocular vision does not obtain until the retinal reflex of convergence (which he brings under the caption of attention) is aroused. He emphasizes the close bond between the psychic phenomenon of attention and the physiologic faculty of convergence. Before the twenty-fifth lesson, when the child's attention was directed to a bright nearby object, one eye would fix and the other wander up and out and oscillate. In the course of the twenty-fifth lesson it was discovered that the child's vision had become stereoscopic, with perfect binocular fixation and total absence of the previous oscillation. [This has much bearing on the etiology of strabismus, and is a subject worthy of the deepest study.]

Methods.—In examining the status of the ocular muscles, A. Duane [4] adheres to the following routine: (*A*) Determine the deviation for distance by (1) the screen, (2) the parallax test, (3) the Maddox rod,

[1] Jour. Am. Med. Assoc., Mar. 16, 1901.
[2] Jour. Am. Med. Assoc., Aug. 18, 1901.
[3] Ann. Ophth., Apr., 1901.
[4] N. Y. Med. Jour., May 25, 1901.

and (4) the phorometer. (*B*) Determine the deviation for 15 inches by (5) the phorometer, (6) the screen, and (7) the parallax. (*C*) Next measure (8) the convergence near-point, (9) the prism divergence, (10) the prism convergence, (11) the field of binocular fixation and the excursions of the eyes. (*D*) In special cases ascertain (12) the declination by the clinometer and (13) the field of fixation by the perimeter. Of the 4 tests, the screen, the parallax, the Maddox rod, and the phorometer, Duane regards the screen test as by far the most reliable. [For actual deviations this is certainly true, and yet the screen test is liable to errors of at least 2°. The parallax test, also originally suggested by Duane, is infinitely more delicate, deviations of 0.5° being easily detected.]

L. Howe [1] shows the relation between the interocular base line and the size of the meter angle, and offers a **visuometer** for the ready and exact determination of the interpupillary distance. By means of it he has constructed a table showing at a glance the degree of convergence in meter angles used by people whose interpupillary distance varies anywhere from 55 to 75 millimeters. He feels that these data are of positive practical value in certain perplexing cases of asthenopia.

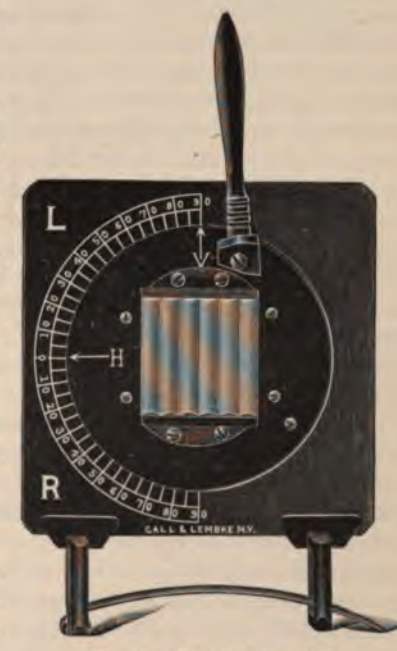


Fig. 104.—Duane's clinometer.

By employing two Maddox rods, one before each eye, A. Duane [2] has had constructed a new **clinometer** for measuring torsional deviations of the eye and also for the study of metamorphopsias (Fig. 104). In 46 eyes in which it was used, 36 were perfectly normal. The limit of observational error should not exceed 2°. Torsion in excess of this, especially if constant, indicates a real tilting of the vertical meridian. The application of this device to the ready detection of the amount of obliquity of the images in any palsy or spasm of the ocular muscles is apparent at a glance.

Heterophoria.—In the management of esophoria high enough to be classed as **latent esotropia,** F. Valk [3] recommends first suitable glasses for the refractive error; these failing, prisms may be incorporated with the glasses; later, possibly tenotomy of the interni, but preferably shortening of the externi, to which he is quite devoted. G. M.

[1] Ann. Ophth., July, 1901. [2] Phila. Med. Jour., June 8, 1901.
[3] Phila. Med. Jour., May 4, 1901.

Gould,[1] on the other hand, believes esophoria to be entirely innervational and dependent on ametropia, and curable or at least largely modifiable by convergence repression. His major conclusions are that (1) orthophoria for 20 feet often means convergence deficiency; (2) exophoria is the most frequent (50 to 1) of all heterophorias and fortunately the most amenable to treatment by prism gymnastics; and that operative interference is practically never called for. G. C. Savage [2] just as emphatically advocates the surgical management of properly selected cases, and exhibits his usual enthusiasm over cyclophoria. In the discussion which followed these two papers at the American Medical Association, Risley [3] insisted on the influence of anomalies in the orbital build in producing many intrinsic muscular anomalies, to which most of the members of the Section assented. Risley, Weymann, Clark, Hiram Woods, and Herbert Harlan argued for operation when other means had failed, while Gould, Reynolds, J. L. Thompson, Allport, Connor, and others preferred to fall back on perfect correction of the refraction, and regulation of the patient's life-habits.

In **exophoria,** W. R. Parker [4] first excludes general or central nervous disease, then refracts very carefully under a mydriatic, and, if symptoms still persist and the deviation is less than 5°, he then trains the positive convergence, even up to 50° if necessary. Failing in this to relieve symptoms, he decenters the lenses to be worn or adds lateral prisms, but never more than 4° strength. Lastly, in deviations of more than 5°, if the foregoing measures are unavailing, he would proceed to tenotomy or advancement.

A. G. Bennett's [5] experience with 3000 private and 1500 dispensary cases inclines him to Gould's opinion that **intrinsic esophoria is really rare.** Six degrees of esophoria is decidedly uncommon, and if not dissipated by the correction of the hypermetropia that goes with it the trouble is most likely with the vertical muscles. The slightest vertical deviation may be the key to the whole problem. Vertical troubles he corrects preferably by tenotomy, but never lateral ones. He evidently reposes much confidence in the findings of the tropometer, "an instrument without which no ophthalmologist can keep house." To the latter statement L. Howe [6] does not assent, claiming that in the determination of the vertical rotations, if the patient be told to look up as far as he can and the degree then measured, the patient may, in the next minute, turn the eye still farther up by 5° or even 10°. [Inasmuch as such rotations are entirely cortical (that is to say, are represented in the cerebral cortex, being voluntary movements), the weight of argument in this particular instance would seem to be with Dr. Howe.]

J. E. Colburn [7] gives full details of 4 cases of **intractable asthenopic headaches,** with insomnia, vertigo, indigestion, and in one case petit mal, persisting in spite of careful refraction. Attention to their muscular anomalies (going as far as tenotomy in 3 cases) gave all of

[1] Jour. Am. Med. Assoc., Nov. 23, 1901.
[2] *Ibid.*
[3] *Ibid.*
[4] Ophth. Rec., July, 1901.
[5] Buffalo Med. Jour., Feb., 1901.
[6] *Ibid.*
[7] Clin. Rev., May, 1901.

them comparative freedom from their previous suffering. The author's experience, embracing over 15 years, leads him to state that in such cases surgical intervention relieves reflex symptoms more promptly than local ones; patients who have for years posed their heads and distorted their bodies to partially correct and lessen their discomfort find it hard to form new muscular habits, so that it is often necessary to refer them to teachers of gymnastics for a time. There is a class of patients who must be held to the most rigid living before they find relief, even though heterophoria may have been the exciting cause; but persistence on their part brings them large rewards. Finally, it is advisable to rerefract patients after such operations, as in some cases they increase and in others diminish any preexisting astigmatism.

G. T. Stevens [1] ascertains by means of the clinometer that the vertical meridians of each retina do or do not coincide with the vertical axes of objects in the outside world. He finds frequent and great deviations and **dissimilarity in the vertical meridians** of the two retinas, both in kind and degree. To the unconscious effort to restore the retinal meridians to their normal positions he attributes many cases of heterophoria and heterotropia, and instead of the tenotomies and advancements which he formerly taught so positively and emphatically, he now recommends "extendocontraction," *i. e.*, advancing one-half of the tendon and severing from its scleral attachment the other half. His arguments and conclusions are based on the findings of the clinometer, and if this instrument is reliable, all other methods of treating imbalance of the ocular muscles are unphilosophic. [It would be unfair to criticize without having studied for one's self his theory and practice, and it would be equally unsafe to adopt them without the confirmatory experience of others.] One of his important statements is that in nearly every case of convergent squint he finds not only excessive, but extravagant, upward rotation of the eyes; *e. g.*, 50° instead of 33°. A reduction of this anaphoria served in a number of cases of marked squint to relieve the defect without any interference with the lateral muscles.

Four cases are presented by H. N. Hoople [2] with **refraction errors** of varying degree and imbalance of the ocular muscles, also history of severe headaches and other asthenopic symptoms in which permanent relief was directly traceable to ablation of the middle turbinal or removal of a spur pressing on it. The symptoms are attributed to disturbances of innervation by an irritated area in the nasal mucosa.

Heterotropia (Squint). — Our knowledge of the physiology of binocular vision and of the pathology of squint in general is so limited as to make particularly welcome such a study of a large array of cases as Claud Worth [3] offers. He analyzes the results in 1278 cases. As to physiology, his investigations on a large number of nonsquinting children indicate that from the sixth to the seventh month is the period when the first evidences of binocular vision are found, while the fusion faculty normally reaches its full development by the end of the sixth

[1] N. Y. Med. Jour., Feb. 16, 1901. [2] Med. News, Apr. 13, 1901.
[3] Lancet, May 11, 1901.

year. Especially gratifying is his insistence that "squint is not a muscular affection pure and simple," but that in addition to the deformity there is always a defective development of the fusion faculty, nearly always suppression of the functions of one eye with resultant amblyopia, and a refractive error. Among his 1278 cases the power of independent outward rotation of each eye separately was fully normal in 83.2%, some defect of abduction in each eye in 9%, and in only 7.7% was there any defect of outward movement confined to the deviating eye alone. Glasses were put on many children under 1 year of age. [The youngest child on record in America to wear glasses was a patient of Gould, aged 19 months.] Worth holds that optical correction, although a most useful auxiliary, is very unsatisfactory as the sole means of treatment. Of the cases treated by glasses alone, the deformity eventually disappeared in 30%. [The one regret is that Worth did not mention the number of years these cases were followed, as many internal squints gradually disappear with the swinging out of the long axes of the orbits incident to the growth in width of the face after puberty.] With Worth the fusion faculty is the thing of importance in squint. If that can be trained he has all the hope in the world for his cases. Presas,[1] too, thinks it wrong to depend entirely upon correction of refractive errors and surgery in the management of squint and therefore urges the use of different sets of stereoscopic cards 15 minutes daily for many months. A. Senn [2] also offers a stereoscope for squinters, so devised that various pieces of No. 3 smoked glass may be dropped in front of either eye (generally the fixing one), and so reducing the intensity of the stimulus in that eye as to encourage the habitually deviating eye to fix without withdrawing all the cortical stimulus to the better eye. Bane [3] uses the occlusion pad in amblyopia along with glasses as early as the second year.

In the discussion on **strabismus** before the Section on Ophthalmology of the American Medical Association this year, E. Jackson [4] laid much stress on the utmost care that should be bestowed on the refraction of such cases, especially that of the poorer eye, claiming that many cases may be cured if treatment is instituted early in life. He exhibited fusion tubes to be used in training fusion both before and after operation, asserting that the use of the eyes during the first few days after tenotomy is highly important, and that perhaps our greatest gain by operation is in the breaking up of old habits of movement. C. F. Clark [5] contended that any result aimed at should be as nearly as possible divided between the two eyes, and argued for advancement as superior to tenotomy on the grounds taken by Landolt some years ago. [We have recently adopted Landolt's plan and are well satisfied with our results.] A. E. Davis [6] believes that 30% of all patients may be cured without operation. Of all surgical measures, he lauds Panas' method of stretching the tendon and muscle thoroughly before tenotomizing it. Of 70 cases so operated

[1] Revist. de Ciencas Med., June 10, 1900.
[2] Arch. f. Augenh., Oct., 1901.
[3] Denver Med. Times, Sept., 1900.
[4] Jour. Am. Med. Assoc., Oct. 26, 1901.
[5] *Ibid.*
[6] Jour. Am. Med. Assoc., Nov. 2, 1901.

by himself and D. B. St. J. Roosa in the past 3 years, 80 % now show parallelism. [The question really is how many of these will present divergence 10 or 15 years from now. Davis states that 10 % of the operated cases already show divergence ("overeffect"), which it is proposed to correct by tenotomizing the externi! Surely the forces that hold the eyeball within their grasp have been already sufficiently weakened in this 10 % of cases to make it unwise to further that effect. Squint operations are at the most a very clumsy effort to make the best of a bad state of affairs, and if our present-day conceptions of the pathology of squint are worth anything, Davis will only add to the difficulties of his "overcorrected" patients by further tenotomies.] J. M. Ray's [1] figures disagree with those of others. For example, he says binocular single vision is not present in more than 7 % of all cases of squint. [True binocular single vision is never present.] He believes that the correction of true alternating squint either by glasses alone or by operation is a more difficult problem to solve than the correction of monolateral squint. [This view is the reverse of that held by most operators, and is, we believe, incorrect.] Most of the members of the Ophthalmic Section showed a preference for advancements, resections, or tuckings of the weaker muscles, to be followed by tenotomy of the opposing muscles if finally found necessary. F. Fergus [2] insists on advancement of both externi on the ground that in convergent squint, as a rule, the externi as measured by the perimeter are weak and the interni no stronger than they ought to be. In this opinion he is joined by J. H. Woodward [3] and H. W. Wooton,[4] who feels that, as primary operations, tenotomies are positively hazardous. T. R. Pooley,[5] however, reposes much confidence in tenotomies. C. A. Veasey's [6] plea for the early recognition and treatment of squint in little children is deserving of widespread publication, in order that medical men generally might be aroused to the vital necessity of doing whatever is to be done for these little ones before they enter school.

Ocular Palsies.—To facilitate the diagnosis of ocular palsies by the diplopia test, H. M. Starkey [7] has devised a new table that by its simplicity ought to be of much value for reference purposes in these conditions. W. L. Pyle's [8] case of extensive laceration of the external ocular muscles with spontaneous recovery is beautifully illustrative of nature's marvelous ability to repair. The patient, a physician of 44, while riding a bicycle at night, ran into a blunt splicing hook made of wire, which entered at the inner canthus of the right eye, and passing under the eyeball, tore its way out of the external canthus. The ensuing diplopia was very puzzling. The wound healed kindly, and 5 months later the patient had full binocular vision and could read with comfort.

Nystagmus.—O. Neustaetter's [9] cases show that unilateral nystag-

[1] Jour. Am. Med. Assoc., Oct. 26, 1901.
[2] Practitioner, Apr., 1901.
[3] N. Y. Med. Rec., Feb. 16, 1901.
[4] Knapp's Arch. Ophth., May, 1901.
[5] Knapp's Arch. Ophth., July, 1901.
[6] Canad. Pract. and Rev., June, 1901.
[7] Jour. Am. Med. Assoc., Nov. 23, 1901.
[8] Jour. Am. Med. Assoc., Mar. 9, 1901.
[9] Arch. Ophth., Mar., 1901.

mus may appear in all varieties assumed by bilateral nystagmus, and is not to be distinguished from the latter in nature. J. Thomson [1] notes that the nystagmus of spasmus nutans in infants is often unilateral and is often vertical or rotary as well as horizontal. It is invariably recovered from in some months.

Economic Valuation of Vision.—H. F. Hansell [2] defines blindness as that degree of loss of vision that incapacitates one from earning his living in any occupation requiring the sense of sight. The earning power begins to suffer when vision has fallen below one-half of normal. Monocular blindness is not incompatible with full earning capacity. If, however, the sight is weak in the remaining eye, the earning power diminishes rapidly. The loss of earning power due to defective vision may be computed according to a simple system based upon the ratio of the loss of vision to the full earning capacity in any age and in most occupations. H. V. Würdemann and H. Magnus,[3] writing on the same subject, say that "approximately a one-eyed person has lost 30 % of his earning power for the first year after the accident and 20 % for each year afterward, this estimate holding only for the higher trades; for the lower class of trades the proportion would be 27 % for the first year and 18 % thereafter. Sudden total loss of one eye is of more economic damage to the individual than when the sight is lost gradually."

Economic Relation of Color-sense.—F. W. Edridge-Green [4] believes that the rods and cones have entirely different functions, holding that light acting on the retina liberates the visual purple from the rods when a photograph is formed, the impression of which the cones and optic nerve-fibers convey to the brain. Thus, the cones are sensitive only to chemic changes in the visual purple and not to light itself. It is easy to conceive how visual impulses set up by decomposition of the visual purple differ according to the character of the light. Then, in the impulse itself we have the physiologic basis of light, and in the quality of the impulse the physiologic basis of color. Unlike other peculiarities of vision, color vision has been considered as practically uniform in the mass of mankind. According to O. G. Rood,[5] whose former work on colors is well known, there is really no such uniformity, and individuals vary as much in this as they do in the other niceties of visual perception. By means of the Flicker photometer (a new instrument for measuring color perception), Rood finds that no two persons agree in this respect, and that the variations are quite striking even in persons ordinarily considered as normal in their color vision. Of 11 persons, selected as normal, he found only 3 whose perception reached the average standard for red, 3 for violet-blue and 5 for green, and that the defects for these various colors varied from 1 % to nearly 20 %. The number of cases examined by Rood is small, but they were carefully selected and observed, and more or less justify his claim that no man or woman is thoroughly qualified to do color work until the color vision

[1] Brit. Med. Jour., Mar. 30, 1901.
[2] Ann. Ophth., Oct., 1900.
[3] Ann. Ophth., Apr., 1901.
[4] Brit. Med. Jour., Oct. 10, 1901.
[5] The Post-Graduate, Oct., 1900.

has been tested with some such apparatus as the Flicker photometer. These experiments also suggest further investigation of the problems of color defect with special reference to the railway and steamship service, looking to the establishment of better standards than those now used. Green [1] would exclude from the marine and railway service all those (1) who possess a psychophysic color perception of but 3 units or less; (2) those who, while having more than 3 units, have the red end of the spectrum shortened to a degree incompatible with their recognition of a red light at a moderate distance; (3) those with central scotoma for red or green.

K. Grossman's [2] **apparatus for conducting quantitative tests** in color is a decided advance toward accuracy in this work. In order to detect all degrees of subnormal color perception, he shows that the test object must be (1) variable in color; (2) variable in size; (3) variable in intensity. He uses actual signal lights in a darkened room, employing a mirror in which the patient observes and tries to match the colors shown by the examiner. He claims that this method enables one to form a standard as simple and useful as Snellen's standards for form vision; the most minute central scotomas are readily recognized; with the average normal central color vision reduced to one-half for green and red, rejection of the candidate is advisable; reduced to one-fourth, rejection becomes an absolute necessity. T. H. Bickerton [3] objects to the Holmgren test that it will not enable the surgeon to decide between the person who loses the ability to distinguish colors at a distance and the one who exhibits a normal color-sense at the near points; hence the less marked forms of color blindness escape detection when the color-sense is examined at the near point only.

THE EYE IN GENERAL DISEASE.

Headache.—According to H. H. Seabrook [4] ocular headache can be differentiated from other forms only by demonstrating the coexistence of ocular strain and proving that it is primary. The frontal and occipital pain that occurs with hypermetropia and astigmatism is exactly the kind of pain seen in iritis and glaucoma from extension, along sensory nerves, of pain from the ciliary body. Among headaches seen by the oculist are a large number in which the eyes play little or no part.

Eye-strain and Digestive Disorders.—Benedict's [5] views in regard to the relation of eye-strain to digestive disturbances are somewhat conservative. He shows that statistics as to the frequency of this relation are not practicable, and that the correction of digestive disorders by glasses is sometimes ineffective, though there is no doubt but that eye-strain in certain conditions may react in pneumogastric reflexes. Pneumogastric reflexes, nausea, etc., are not caused by any sensory dis-

[1] Brit. Med. Jour., Oct. 26, 1901.
[2] Brit. Med. Jour., Dec. 22, 1900.
[3] Brit. Med. Jour., Mar. 17, 1901.
[4] Med. Rec., July, 1901.
[5] Medicine, Jan., 1901.

turbances other than those of sight and equilibrium, excepting changes of temperature and psychic translation.

Pregnancy and Parturition.—B. Bosse [1] has been studying the eye-grounds in pregnancy among 124 gravid women in the hospital, all of whom were examined ophthalmoscopically from the fourth month on to delivery and after. There were found signs of congestion in the optic disc, increasing in intensity up to and well marked after the seventh month ; these signs were present in three-fourths of the women the last week or two of pregnancy. Extreme degrees, however, were rare. Resolution after delivery was speedy, no sign of the congestion remaining in any of the women after the fifteenth day. W. L. Pyle [2] gives the clinical history of a case of **metastatic postpartum panophthalmitis** in which the globe ruptured spontaneously in its posterior segment. From the pathologic study of his case and a review of the literature, he believes that the primary lesion is in the retina. To these symptoms C. A. Wood [3] adds weakened accommodation, small hemorrhages into various parts of the eye, infrequently detachment of the retina and albuminuric retinitis.

Acute Infectious Diseases.—Bilateral iritis and keratitis following in the wake of mumps is recorded by A. Pechin,[4] who says there could be no doubt at all as to the connection between the mumps and the eye trouble. Moore [5] resolves the literature of the ocular phases of influenza into the following conclusions : (1) Many cases reported as influenzal are of doubtful etiology. (2) The nervous apparatus of the eye is especially liable to become involved as the infection of influenza produces a toxin that has special affinity for the nervous system. (3) The ocular manifestations are usually first influenzal ; metastatic and embolic complications are usually detrimental to the integrity of the eye. E. Koenig [6] observed optic neuritis as a manifestation of typhoid, the infection thus proving the existence of an optic neuritis of microbian origin without, necessarily, the cooperation of any other cause. Neuritis and retinal thrombosis following after acute malaria have been seen by Galezowski,[7] all of the cases (4) recovering under free use of quinin salicylate. The most important ocular findings in cerebrospinal meningitis mentioned by B. K. Chance [8] are conjunctival discharge, paralytic squint and mydriasis, unequal pupils, and edematous nerve heads and retinas, but no hemorrhages or emboli. In an epidemic of smallpox in Lyons, France, last year (numbering 800 cases), 2 patients became blind.[9] It was finally found that instillation of a 0.2 % solution of methylene-blue, several times a day, at the slightest suspicion of disturbance in the eye, was as effective a prophylactic measure as silver nitrate in ophthalmia neonatorum. Touching the ocular complications of smallpox, Dufour [10] quotes Landesberg's figures, drawn from 270 cases, showing conjunctival affections in 57 %, lacrimal in 5.5 %, corneal

[1] Arch. Ophth., May, 1901.
[2] Am. Med., May 11, 1901.
[3] Ophth. Rec., Apr., 1901.
[4] Rec. d'Ophth., June, 1901.
[5] Albany Med. Ann., July, 1901.
[6] Brog. Med., Feb., 1901.
[7] Bull. de l'Acad. de Méd., May 14, 1901.
[8] Ann. Ophth., Apr., 1901.
[9] La Semaine Méd., May 1, 1901.
[10] Ann. d'Oculist, May, 1901.

in 30%, iritic in 3%, and uveal diseases in 1.5% of the cases. [The fact that blindness may result from a single pustule on the cornea shows that we cannot overestimate the necessity for expert treatment in smallpox.] In the recent severe epidemic of plague in Platna, Maynard [1] found ocular complications in 12, in all of which the disease was pronounced. Keratitis and iritis were the principal lesions. At necropsy, hemorrhage into the eye was found in all but 1 case. Treatment was of no avail, probably because of the collapsed condition of the patients. In 10 cases of leprosy, During and Fratas [2] found conditions which they look upon as pathognomonic; namely, a large round spot in the neighborhood of the vessels around the macula, surrounded by a number of yellowish-white spots. [This finding has been verified by other investigators.]

Rheumatism and Gout.—Trousseau [3] considers iritis and corneal sclerosis as the first signs of gout or rheumatism to appear in the descendants of gouty or rheumatic families. Hemianopsia, it is said, is far from exceptional with arteriosclerosis even when nephritis is in an incipient stage. It therefore becomes a more or less important sign. In 5 cases observed by Rendu [4] 2 soon terminated fatally. Treatment should aim to diminish arterial tension with its attendant danger of hemorrhages. Iodids should never be administered during the acute phases of the headache, nor any of the heart tonics, on account of the danger of congestions. E. Jackson [5] emphasizes the importance of ophthalmic examinations in cases of discovered or suspected kidney disease, stating that noticeable changes are found in 50% of such cases and distinct albuminuric retinitis in not less than 10%. Concerning the vascular changes in the eye in albuminuria, Gunn and Grimsdale [6] write as follows: In the prealbuminuric cases the arterial reflex is narrow and bright, and occasionally the coats of the artery can be traced as white lines beyond the margin of the disc. Where the arteries cross the veins, the vein appears to be pushed back by the artery into the retina, and as a result the light reflex is lost for a short distance on each side of the crossing. Later come the "flame-shaped" hemorrhages with occasional thrombosis of the central retinal vein, always giving rise to a grave prognosis. J. N. Study [7] speaks of a woman who at the fourth month of gestation showed 10% of albumin in her urine, with reduced vision. Premature labor came on at the eighth month spontaneously, after which there was temporary improvement, but the woman died 3 months later.

Diabetes.—L. A. W. Alleman [8] remarks that ocular symptoms are more likely to be found in chronic than in acute diabetes. The ocular palsies found with diabetes are to be ascribed to nuclear or peripheral hemorrhages. Paralysis of accommodation is perhaps the most frequent complication of diabetes and should always suggest the latter. Retinal

[1] Brit. Med. Jour., Sept. 14, 1901.
[2] Deut. med. Woch., Mar. 1, 1901.
[3] Jour. des Pract., Jan. 5, 1901.
[4] La Semaine Méd., June 12, 1901.
[5] N. Y. Med. Jour., July, 1901.
[6] Edit., Phila. Med. Jour., Oct. 27, 1901.
[7] Med. Rec., N. Y., Apr. 27, 1901.
[8] Jour. Am. Med. Assoc., Jan. 26, 1901.

and subconjunctival hemorrhages are, he believes, always suggestive of diabetes, particularly the small punctate ones. He does not think they have any special portent, for he has known diabetics to live many years with recurrent retinal hemorrhages. Central scotoma, practically identical with the clinical picture of tobacco amblyopia, is also sometimes due to diabetes. All the symptoms and signs, however, are of more diagnostic than prognostic import.

Gonorrhea and Syphilis.—The ocular affections known to occur in association with gonorrhea (exclusive of gonococcus conjunctivitis) are, according to J. B. Lawford,[1] metastatic conjunctival inflammation, scleritis, episcleritis, iritis and iridocyclitis, and neuroretinitis. Yeld's analysis [2] of 159 cases of primary iritis at St. Bartholomew's Hospital showed 8% to be of undoubted gonorrheal origin—*i. e.*, gonorrheal arthritis and iritis occurred together. A. Trousseau [3] looks upon the appearance of eye lesions in the course of syphilis as indicating a profound infection that is much more likely to lead to grave sequels than in syphilis without such manifestations. H. Harlan [4] relates the case of a 9-year-old boy with severe interstitial keratitis who, after a 3 weeks' stay in the eye hospital, contracted measles. Three days after the eruption appeared his eyes were considerably better, and from that time on there was singularly rapid improvement in vision in each eye. Harlan says the improvement in the 3 days above mentioned was as great as he had ever seen occur in similar cases in many months.

Tuberculosis.—Sydney Stephenson [5] believes it will be generally conceded that the existence of changes in the mouth, nose, and ear strengthens the view that phlyctenulosis ocularis is nothing more nor less than eczema of the conjunctiva developed upon a tuberculous locus minoris resistentia. [Four years ago one of the editors of this department directed attention to this same view, and urged ichthyol as an efficient remedy for ocular eczema.] Bull [6] regards tuberculosis of the eye as rare and its diagnosis as particularly difficult, because in many cases the bacilli and the giant cell are the only determining factors. Galezowski [7] believes tubercular choroiditis to be a more common affection than is generally supposed, but seriously doubts the existence of conjunctival tuberculosis. Operative treatment in the latter should, in his judgment, be postponed as long as possible.

Blood Dyscrasias.—On turning over the right upper lid of an underdeveloped female child of 2 weeks, Oetlinger [8] noticed bleeding from the conjunctiva, followed the next day by hemorrhages under the skin. The bleeding was uncontrollable and death ensued in 6 days. The writer thinks it was a case of congenital hemophilia. A study of a number of chronic leukemics by L. Pick [9] showed sclerotic retinal patches and retinal hemorrhages as the principal changes. Their etiology is not clear, as such changes are practically constant in malignant tumors of the

[1] Brit. Med. Jour., Nov. 2, 1901.
[2] *Ibid.*
[3] Indian Med. Rec., Dec., 1900.
[4] Knapp's Arch., Jan., 1901.
[5] Med. Press, Oct. 30, 1900.
[6] Med. Rec., Dec. 8, 1900.
[7] Rec. d'Ophth., Oct., 1900.
[8] Tschenedelnik Woch., No. 16, 1900.
[9] Klin. Monatsbl. f. Augenh., Mar., 1901.

stomach and other organs. In leukemia, however, they have no special significance, the most pronounced retinal degeneration often running its course without showing any subjective symptoms. In a case of Ankylostoma duodenalis H. F. Hansell [1] found both optic discs edematous and the retinas infiltrated with serum in a small zone surrounding each disc, beyond which were small hemorrhages. The retinal arteries were mere lines and seemingly filled with water instead of blood. The veins were tortuous and dark, and coursing in them the blood current could be seen plainly. Hansell attributes the extravasations to altered blood constituency rather than ruptured blood-vessel walls. In a woman aged 38, the proportion of whose white to red blood-cells was 1 to 28, K. Grunert [2] also saw the moving of the blood current in the retinal veins without any trouble, and thinks it was visible only because of the great slowing of the circulation.

Central Nervous System.—To facilitate study of the various symptom-complexes growing out of the lesions of the second, third, fourth, and sixth nerves, L. Stricker [3] has produced an original chart of the neuronic architecture of the visual apparatus that should prove of great worth. It is based on the exhaustive researches of St. Bernheimer, of Vienna,[4] covering many years. These were followed in various directions,—namely, by anatomic study of infants and embryo brains, experiments on animals, clinical and pathologic study of the same lesions in the human subject,—all confirmed by physiologic experiments on anthropoid apes. The chart represents an entire cross-section of the brain made on a level with the optic thalami. A. Merz [5] is convinced from experiments on dogs and rabbits, that elevated cranial pressure can, by itself, cause choked disc if this pressure be kept up uninterruptedly for a certain length of time; periodic increase of pressure will only tend to produce venous hyperemia. The author thinks the resemblance of the dog's eye is so close to the human that his experiments may be regarded as indicating pretty surely what takes place in choked disc in human beings. In the discussion of an obscure case of hysteria, reported by H. A. Hare,[6] G. E. deSchweinitz [7] remarked that hysteric amblyopia is doubtless the most frequent of all the hysteric anesthesias. Generally the left conjunctiva is affected. (In Hare's case it was the right one.) Loss of sensation around the amblyopic eye is also common. The pupils may be contracted or dilated. (In this case the right was dilated and the left contracted.) If the pupil be dilated, the reflexes are usually preserved. Complete mydriasis on one side, with slight preservation of the reflexes and equally complete miosis on the other side without spasm of accommodation and photophobia (as exhibited by Hare's patient), is unusual if not unique.

In addition to tabes and general paralysis W. Harris [8] has met the **Argyll Robertson pupil** in juvenile locomotor ataxia, general paralysis

[1] Am. Med., Sept. 14, 1901.
[2] Klin. Monatsbl. f. Augenh., Aug., 1901.
[3] Jour. Am. Med. Assoc., Mar. 2, 1901.
[4] Graefe-Saemisch, Handb., second edit., parts 15 and 16, 1901.
[5] Arch. f. Augenh., Bd. XLI.
[6] Am. Med., Apr. 6, 1901.
[7] *Ibid.*
[8] Brit. Med. Jour., Sept. 29, 1900.

with history of acquired syphilis, progressive muscular atrophy, lead-poisoning, aortic aneurysm, hemiplegia, choroiditis, and in numerous instances in patients who presented themselves for all manners of symptoms, showing, however, no ataxia or anesthesia, and presenting normal knee-jerks, but with a clear history of syphilis in almost every case. The writer looks upon unilateral reflex iridoplegia as but a stage in the development of the Argyll Robertson pupil [a view now meeting with much acceptance]. Furthermore, he is disinclined to believe that a nuclear lesion is at the bottom of this phenomenon, feeling that sclerosis of some of the concerned fibers is much more likely to be found the real cause. T. Lauder Brunton [1] has noticed in alcoholic neuritis that the pupil reflex to light is rapid and extensive, whereas the contraction with accommodation is slight and sluggish, or even entirely wanting; in other words, just the reverse of the Argyll Robertson phenomenon. Another unusual pupillary condition is reported by Silex,[2] who saw the paradoxic pupillary reaction in a woman of 52; that is to say, her pupils would dilate at once under the influence of strong light, great care being taken that she did not accommodate. There seemed to be no satisfactory explanation of the condition. H. Solomonsohn [3] states that while the presence of the hemianopsic pupillary reaction is of positive localizing value, its absence does not imply anything in particular. He details a case of monocular temporal hemianopsia with hemianopsic pupillary reaction as occurring in a patient in whom after death a cystadenoma the size of a walnut was found in the sella turcica. [This was probably a case of poorly defined akromegaly.]

G. Astolfoni [4] states that the **pupil contracts during the premenstrual period,** the miosis reaching its maximum during the first few days after the flow is established. He attributes the phenomenon to disturbances in the general metabolism rather than to a reflex emanating from the genital organs.

THE EYE AND NOSE.

In Miller's report of 2 cases of **blindness due to sphenoidal sinus disease** [5] stress is laid upon the syphilitic origin of most cases of a similar character. Blindness came on in 48 hours, from complete atrophy of both optic nerves. The nasal affection consisted of necrosis of the septum of the sphenoidal and ethmoidal sinuses, resulting in cerebral complications and death in the first case; and in the second in a small sore in the roof of the mouth, followed by disease of the septum and sinuses and by blindness that became complete in 4 or 5 days. [Our own experience includes a case that belonged to this category, in which blindness ensued in less than 12 hours. There was previous purulent discharge from the ethmoid and probably the body of the sphenoid bones. The conspicuous symptom was a large and complete

[1] Brit. Med. Jour., Dec. 1, 1900.
[2] Zeit. f. Augenh., June, 1900.
[3] Deut. med. Woch., No. 42, 1900.
[4] Gaz. deg. Osped., Apr. 21, 1901.
[5] Brit. Med. Jour., Dec. 22, 1900.

central scotoma, perception of light being retained only in the periphery of each field. The arteries and veins were greatly contracted and the nerve-heads white. Later in the history of the case the degeneration of the optic nerve-fibers extended into the nerve-fiber layer of the retina, and 4 years later vision equaled counting fingers at 1 foot.] The clinical picture of the ocular symptoms of intranasal disease is stated by Sattler [1] to be: (1) Persistent injection of the vessels of the ocular conjunctiva, with prominence and distention also of the muscular branches, often accompanied by passive edema of the retrotarsal folds. The palpebral conjunctiva does not ordinarily participate in this ocular engorgement. (2) Persistent neuralgia, conspicuous for its "nagging" character, associated with most distressing functional disturbances of the eyes. One-sided optic neuritis, rebellious to all recognized treatment and disappearing after removal of adenoids, is recorded by Koenigshofer [2] as occurring in a woman of 21. The vegetations evidently caused a great disturbance in the orbital circulation of the affected nerve. D. T. Vail [3] differentiates three types of optic neuritis of nasal origin. (1) Acute fulminating retrobulbar neuritis due to mechanical compression of the optic and ophthalmic divisions of the fifth nerve from swelling of the sphenoidal cavity walls; (2) acute retrobulbar perineuritis and optic leptomeningitis due to infection carried from the nose via the lymph-channels; (3) retrobulbar optic neuritis secondary to optic venous thrombosis, the origin of which he states is nasal in the vast majority of cases. In the treatment of the first form he would not hesitate to remove part or all of the middle turbinated bone, as the middle and superior straits of the nose are ideal places from which to draw blood, affording a two-fold purpose, namely, bloodletting and drainage. Hoople [4] states that mechanical pressure in the region of the middle turbinate may produce muscular asthenopia by temporarily impairing the function of the ciliary muscle.

DISEASES OF THE LIDS.

Favus of the lid is a rare disease. A. Gloor [5] describes the fifth case ever reported. The ulcer is covered by a yellow-brown dry crust, sharply limited, and extending only through the epithelium. In its center is an excavation filled with a white powdery mass which contains the sporidia of Anchorion schoenleinii. It is cured by softening of the crust and frequent washing with bichlorid 1 : 4000. The source of the contagion is uncertain, although it was in this case probably derived from mice.

Demodex, a species of parasitic insects, was found by Hunsche [6] to be present in a large number of small hard sacs of the eyelid; in fact, in 92% of all cases and in 100% after the age of 40.

Strzeminski [7] states that he has cured 63 **chalazions** of more than

[1] Jour. Am. Med. Assoc., May 18, 1901.
[2] Die ophth. Klin., Jan. 5, 1901.
[3] Am. Jour. Ophth., May, 1901.
[4] Med. News, July 27, 1901.
[5] Arch. Ophth., July, 1901.
[6] Münch. med. Woch., Nov. 6, 1901.
[7] Rec. d'Ophth., Aug., 1900.

6 weeks' duration by absorption. He employs the following ointment: pure iodin, 3 grains; potass. iodid, 9 grains; aq. destill., 12 drops; lanolin, 1 dram; rubbing it into the skin of the lid over the tumor once daily. Absorption ought to be complete in 2 to 8 weeks. If not, excision is in order. [Surgery need not be resorted to in all cases. A chalazion is not, as has been until recently supposed, a true retention cyst, but a hyperplasia of epithelium and of connective tissue and retained secretion, partly surrounded by an imperfect wall. In view of the pathology, absorption will not infrequently follow massage and inunctions.]

F. Furgus [1] objects to **Panas' ptosis operation** because of the ugly cicatrices it leaves, and therefore he modifies it by making an incision through the eyebrow and undermining the skin 2 inches above the cut and below to the lid margin, and separates from all but its upper attachments a strip of the occipitofrontalis muscle ¾ inch wide, which he brings down and fastens as close to the lid border as possible. [This seems to be a far more difficult operation and one that is likely to be followed by reaction and cicatrices that would make one hesitate before resorting to it.]

Gailliard [2] has observed 3 cases of **acute idiopathic edema** of the eyelids in 12 years, all in young persons. It is a recurrent affection without prodromes, most intense in the morning. It predominates on one side or is unilateral. From the very beginning it attains such enormous proportions that it cannot be confounded with cardiac or renal affections. It is soft and devoid of redness, not accompanied with alterations in the eyes, and generally lasts from 24 to 36 hours. The patients belong to rheumatic and neurotic families.

H. Herbert [3] (Bombay) gives his experience with 130 upper lids operated for **entropion** and **trichiasis** by Snellen's method [grooving of the anterior surface of the tarsus]. He insists on the following points: The strip of skin taken away should be at least 2 millimeters broad and the depth of the tarsal wedge removed in all cases sufficient to completely divide the tarsus and should be cut out from its lower edge. Snellen's method of suturing is not so efficient as Green's. By combining these two methods of operating the results are satisfactory.

CONJUNCTIVA.

Phlyctenulosis.—Although the phlyctenule occurs most frequently in scrofulous and tuberculous children, Uthoff [4] feels that it should not be considered as directly characteristic of scrofula. He has observed in a certain, although small, percentage of cases phlyctenules occurring without the slightest symptoms or history of scrofula, tuberculosis, or previous disease of the eye.

Purulent Conjunctivitis in the Newborn.—Credé's method of

[1] Brit. Med. Jour., Mar. 30, 1901.
[2] Lancet, Jan. 5, 1901.
[3] Lancet, Nov. 3. 1900.
[4] Berlin. klin. Woch., Dec. 3, 1900.

prophylaxis against purulent conjunctivitis in the newborn has been vigorously attacked from several quarters in the past year. D. S. Reynolds,[1] for instance, disapproves of it, stating that in the maternity ward of the city hospital in his city, nearly every child born developed the disease until the Credé method was abandoned (at his instigation), and afterward no new case appeared. His feeling is that when the baby is born, the vernix caseosa should be removed from the skin by thorough application of petrolatum with the clean hands of a trained nurse. This is then removed with a mop of cotton on the end of a probe, care being taken to prevent touching the inner canthus. If inoculation is suspected, sterilizing the surface of the conjunctiva is all that is necessary to retard the growth of a freshly introduced ferment. Schmidt-Rimpler [2] asserts that Credé's method has accomplished little or nothing toward averting ophthalmia neonatorum in a number of localities, and expresses the opinion that it is not caused exclusively by the gonococcus. As to therapy, his preference is for weak chlorin water or dilute potassium permanganate solution. Groenow,[3] too, denies that purulent conjunctivitis in the newborn is always associated with the presence of the gonococcus, basing this statement on an analysis of 100 cases. In this statement he is supported by F. Schanz,[4] who shows that the pneumococcus, streptococcus, and Koch-Week's bacillus all produce much the same clinical picture as the gonococcus. As to treatment, C. H. Williams [5] thinks solutions of protargol less reliable than silver nitrate, while W. A. Holden [6] claims that recent statistics show quicker cures with less discomfort for protargol than for the nitrate. Holden's position is rather strengthened by the findings of N. Guerola,[7] who, in a large number of cases, treated one eye with 2.5% silver nitrate solution and the other eye with 50% protargol solution, with the results vastly in favor of the latter. Guerola commends the organic drug for all the reasons given by other investigators and the additional reason that it is entirely safe even with considerable corneal lesions.

Diphtheric Conjunctivitis.—Diphtheric conjunctivitis is rare enough in America to make interesting McCallum's [8] case of secondary ocular diphtheria, to which he adds the report of 4 other cases that came under the notice of Wilson and Tweedy. Extension by way of the nasal duct is extremely rare, infection usually resulting from rubbing with the fingers or with rags soiled with diphtheric discharges. While less contagious than the other forms, isolation is advisable. It is also to be borne in mind that a fatal issue is much more likely to attend secondary ocular diphtheria.

Trachoma.—Disregarding the theory of contagion from contact with gonorrheal patients, towels, etc., generally accepted in densely populated

[1] Jour. Am. Med. Assoc., Jan. 6, 1901.
[2] Woch. f. Ther. u. Hyg. des Aug., No. 35, 1901.
[3] Graefe's Arch. f. Ophth., Bd. XLII, No. 1.
[4] Zeit. f. Augenh., June, 1901.
[5] Boston M. and S. Jour., Feb. 7, 1901.
[6] Med. News, May 18, 1901.
[7] Inaug. Thesis, Anales de Oftal., Nov., 1900.
[8] Canad. Jour. Med. and Surg., June, 1901.

communities, C. Ziem [1] has studied the etiology of trachoma in countries where it is epidemic or endemic, such as Hungary, Egypt, and Syria. The following causes are assigned: (1) Excessive heat and glare; (2) fine powder and dust; (3) miasma from swamps and moors acting directly upon the conjunctiva or nasal mucosa, or even affecting the eyes by way of the alimentary tract. He believes that dusty and sand-laden air is a more important factor in the production of trachoma than contagion. H. Adler [2] affirms that it is undoubtedly of bacterial origin. Corrosive sublimate solutions (1 : 1000 to 1 : 5000) have been effective in his hands. In the mechanical treatment of this disease he prefers rubbing the conjunctiva with 1 : 7000 sublimate solution [why so weak?], while surgically Knapp's roller forceps has given him the most satisfaction. In Lapersonné and Paunblain's [3] experience a 1 % aqueous solution of abrin (the active principle of jequirity) produces very satisfactory results in the papillary stage of trachoma. The conjunctival surface of the upper lid is swabbed with a 1 % solution on a cotton carrier, and this is repeated on the second and sometimes on the third day. Conjunctival scars were quite noticeable in several cases some months after cure [which is no small drawback in the treatment of a disorder whose every tendency is toward deformity of the lid (with all its sequels) by scar-formation in the tarsal conjunctiva. A remedy like iodin, that alters but does not destroy the tissues, seems much more to the purpose]. Copper sulphate, says C. H. Williams,[4] has damaged more eyes than it has ever benefited, and its good results may be obtained with safer and less painful means, such as weak silver nitrate and sublimate solutions. Expression may hasten cure, but he does not think it essential. S. Snell,[5] on the other hand, finds cuprol (a new copper product) quite as effective and very much less irritant than copper sulphate. It is a combination of nucleinic acid and copper, the latter in the proportion of 6 %. It is used as a fine impalpable powder dusted into the eyes just like the calomel of old. This is done two or three times weekly, with a 5 % aqueous solution, for home use three times daily as a collyrium. Elschnig [6] recommends massage "by means of a glass rod, on the end of which is a pledget of cotton wet with a solution of hydrargyrum oxycyanate 1 : 4000." The rod is passed under the lid and rubbed well over its under surface while pressure is made from without on the same point with the index finger, this procedure being done at first every day and later every second day. [This method seems to have become popular in Germany. Another method is to employ an ointment of hydrargyrum directly to the palpebral surface of the lid on the glass rod without using the cotton pledget.]

Pooley [7] prefers **expression in properly selected cases,** and insists upon the need of after-treatment. For this purpose A. A. Cannaday [8] has modified Knapp's roller forceps by substituting for one of the

[1] Wien. klin. Woch., Oct. 18, 1901.
[2] Canad. Pract. and Rev., Mar., 1901.
[3] Arch. d'Ophth., Aug., 1900.
[4] Med. Rec., Sept. 21, 1901.
[5] Lancet, Sept. 14, 1901.
[6] Münch. med. Woch., Mar. 5, 1901.
[7] N. Y. Med. Jour., Dec. 15, 1900.
[8] Jour. Am. Med. Assoc., Feb. 24, 1901.

fluted rollers a sharp tooth roller, the teeth being about 1 millimeter long and moderately sharp. After disinfection and cocainization the toothed roller is passed over the granules piercing them, when the instrument is reversed and the fluted roller expresses the contents of the granules. For the past 18 years M. E. Mulder [1] has successfully resorted to **blepharosphincterectomy** to lessen the pressure of the upper lid upon the cornea in all cases in which the corneal trouble is apparently aggravated or kept up by increased contraction or spasm of the orbicularis—a condition very common in trachomatous and scrofulous keratitis. In most cases keratitis is warded off and an already existing keratitis gets well more easily. Relapses are infrequent. The operation is done under cocain, by making an incision the entire length of the lid about 2 millimeters above the lid border. By a second incision a small oval flap of skin 2 to 4 millimeters broad is removed along with all the underlying muscle-fibers, when the wound is closed with two or three sutures. M. L. Foster's review [2] of the whole literature of entropion and trichiasis, while it offers nothing new, is still of great value in furnishing ready reference to those who had best look it over carefully before launching descriptions of supposedly new operations for malposed lids. They are likely to find here exactly what they thought was original with themselves.

Traumatic Conjunctivitis.—J. W. Sherer [3] reports the case of a physician, aged 29, who had been daily exposed to the action of the x-rays for over 3 years, in consequence of which photophobia and eye-fatigue ensued. The author believes that the changes were analogous to those resulting from prolonged exposure to solar light. Schmidt-Rimpler,[4] by experimental research, reaches the conclusion that lime injuries to the conjunctiva result not from combustion, but chiefly from cauterization. The white opacity produced in the cornea is due to the formation of calcium albuminate. He deems abundant flushing with water advisable to start with, after which the damaged parts are to be kept liberally bathed with sweet almond oil. H. G. Stutzer [5] quite agrees with the foregoing. W. C. Posey [6] flushes away all irritant material, then everts the lids and goes over them with oil or a dilute solution of vinegar. Sugar in concentrated solution may be used and ice compresses in the after-treatment are always advisable.

Tuberculosis.—In the case of a child of 3, who exhibited several small gray nodules on the temporal aspect of the ocular conjunctiva, H. F. Hansell [7] was led by the microscopic appearance to make a diagnosis of tuberculosis of the conjunctiva. Notwithstanding Eyre's dictum that this lesion shows no spontaneous tendency toward recovery, Levy [8] tells of a child whose eye was infected from a cervical tuberculous abscess. A small particle of the diseased conjunctiva was introduced into the anterior chamber of a rabbit, giving rise to typical tuber-

[1] Klin. Monatsbl. f. Augenh., Nov., 1900.
[2] Ann. Ophth., July, 1900.
[3] N. Y. Med. Jour., Sept. 21, 1901.
[4] Berlin. klin. Woch., No. 36, 1900.
[5] Deut. med. Woch., No. 37, 1900.
[6] Jour. Am. Med. Assoc., Mar. 2, 1901.
[7] Ann. Ophth., July, 1900.
[8] Klin. Monatsbl. f. Augenh., May, 1901.

culous iritis some weeks later. However, the parents refused operation, and several months later, when Levy saw the child again, healing was absolutely complete, and that without any treatment.

Primary Chancre.—The list of cases of chancre of the conjunctiva is added to by Sanz Blanca,[1] who reports the lesion as occurring in a woman of 22 whose husband had pharyngeal mucous patches. Both husband and wife later developed secondary symptoms.

Newgrowths.—Papilloma of the conjunctiva and eyelids, going over into carcinomatous degeneration, is reported by S. D. Risley and

Fig. 105.—Section of growth from conjunctiva, showing cross-section of a papilla, unusual size of cell nuclei, and number of karyokinetic figures (Risley and Shumway, in Ann. Ophth., July, 1901).

E. A. Shumway.[2] The subject was a man of 65. Microscopic study of the case revealed all the nuclei of unusual size and a number of karyokinetic figures. (See Fig. 105.)

LACRIMAL DISEASES.

Another instance of **primary carcinoma** of the lacrimal gland is recorded by F. Buller and W. Gordon.[3] The tumor was removed by Kronlein's method, and proved on examination to be an enlarged gland covered by a capsule, showing under the microscope carcinomatous tissue.

[1] Arch. de Oftal., Jan., 1901. [2] Ann. Ophth., July, 1901.
[3] Montreal Med. Gaz., Oct., 1900.

In the treatment of **lacrimal stricture** Mial [1] resorts to electrization of the lacrimal passages by applications of the electric current through a Bowman's probe at intervals of a week. He says the knife is unnecessary and should be wholly replaced by the electric bougie. The duct is kept open painlessly and without hemorrhage by a current of not more than 3 milliamperes. The positive pole is a flat sponge applied to the back of the neck. After withdrawing the probe he washes out the canal with a 4% solution of protargol. [It is possible that the protargol has as much influence in bringing about a cure as the electrization.] C. D. Maynard [2] has made a nasal duct probe that may be dilated after introduction into the duct. [It has the advantage of being less painful than the ordinary probe and possibly easier of introduction.] In nearly 200 cases of nasal duct obstruction, A. McGillivray [3] has had gratifying results from dividing the stricture with a modified Weber knife and inserting a 2 millimeter style, which is left in position for 3 months. [This seems like recommending a method that is already too well and favorably known to need further recommendation.] In chronic purulent disease of the lacrimal sac, E. A. Pond [4] suggests to replace the unsatisfactory treatment by probing the following simple procedure. A long silver probe, with one end blunt and the other with an eyelet large enough to carry a coarse silk string, is threaded and passed through the canal into the nose, where the end is seized with a pair of forceps and drawn out through the nostril. The probe is then unthreaded and the string left in position with the ends tied together. The string is worn about 1 week, being drawn through the nose two or three times a day. In tying, Pond makes a knot which, when pulled through the canal, dilates the stricture. He has used this operation for 4 years with good results. [This suggestion is a good one, but is open to the objection that some patients would refuse, on account of appearances, to wear the string as long a time as might be necessary or desirable.] Instead of extirpation of the sac, Scheffels-Krefeld [5] believes that obliteration is more suitable. It can be performed without general anesthesia and leaves no scar. He cuts both canaliculi until the knife can be carried down through the upper canaliculus into the bottom of the sac and then outward into the lower canaliculus without any resistance. After cautiously cauterizing the bottom of the sac with Vienna paste (2 minutes) he packs with cotton. Healing is rapid. [The enucleation of the sac is usually a simple operation; the scar is insignificant and the results admirable. Axenfeld has devised a neat skin speculum by which the edges of the incision are separated during the manipulations.]

Modified Axenfeld Speculum.—Lancaster [6] has operated in 5 cases for persistent epiphora and purulent inflammation of the lacrimal sac by removal of the gland and sac. As a result of this operation there is

[1] N. Y. Med. Jour., Oct. 20, 1900. [2] Lancet, Dec. 30, 1899.
[3] Scottish M. and S. Jour., Jan., 1901. [4] Med. Rec., N. Y., Feb. 2, 1901.
[5] Klin. Monatsbl. f. Augenh., Apr., 1901.
[6] Boston M. and S. Jour., Jan. 10, 1901.

never an absolute dryness of the conjunctival sac, and in some cases the diminution of moisture is almost insignificant. The dangers of the operation are disfigurement, orbital abscess, injury to the optic nerve and cornea during the operation, and ptosis.

DISEASE OF THE CORNEA.

Physiology.—Ulrich [1] thinks that Descemet's membrane does not check the entrance of aqueous humor into the cornea, but only limits it. His experiments showed that scar tissue is less capable of inhibition than the normal corneal tissue, and perhaps the lymph circulation also offers hindrance to its free passage.

Interstitial Keratitis.—P. A. Callan [2] believes that most cases of interstitial keratitis in children are due to congenital syphilis, although evidences of this dyscrasia are not found in more than a slight percentage of such cases. The affection is at first monocular; invariably the second eye becomes inflamed, and no local or constitutional treatment has thus far been able to keep the second eye healthy. That a person who has recovered from congenital syphilis [can such a person recover?] can be infected later is indicated by F. Mendel's [3] case of a young man whose mother was syphilitic and who in the first year of life survived an attack of congenital syphilis. In his twenty-second year he acquired syphilis and developed in its course diffuse keratitis, which disappeared under energetic inunction of mercury.

Dionin.—Darier [4] has had a favorable experience with dionin in 5 % solution in the relief of pain in corneal and uveal inflammations. He has also found it effective in glaucoma. He instils 2 or 3 drops every few minutes until chemosis occurs. [On Darier's recommendation we have used dionin in a case of nonspecific iritis for the relief of pain and were sorely disappointed in its results. The pain was aggravated and the inflammation increased.]

Aspergillus Keratitis.—J. M. Ball,[5] in describing the condition known as "aspergillus keratitis," gives the following summary: It is a more common disease than writers on ophthalmology suppose. Its chief sign is intense pain in the eye, followed by the development of a brownish or black mass within the substance of the cornea. Removal of the mass early in the case will lead to cure. Failure to recognize the condition and apply proper treatment is followed by sloughing of the cornea and in some cases by loss of the eye. In the few cases of keratomycosis aspergillus in which cultures have been made, Bacillus A. furungatus only has been found.

Rodent Ulcer.—H. Friedenwald [6] is enthusiastic over the results obtained from the use of tincture of iodin in superficial rodent ulcer of the cornea. He prepares the eye with cocain and fluorescin and then

[1] Arch. Ophth., May, 1901. [2] Am. Gynec. and Obstet. Jour., Feb., 1901.
[3] Centralbl. f. prakt. Augenh., Jan., 1901.
[4] Bull. de l'Acad. de Méd., Apr. 17, 24, 1900.
[5] Am. Med., July 6, 1901. [6] Am. Jour. Ophth., July, 1900.

applies the iodin freely to the ulcer and pays particular attention to the area 1 to 2 millimeters about it. "The only error," he says, "likely to be made is to apply it too cautiously, for I have never seen any ill effects from its free use. Since I have become bolder in using it, it is rare that I need to make a second application." [Our habit is to apply the tincture freely and without cocain to the floor of every purulent corneal ulcer and to repeat the application until signs of regeneration of the lost tissue are apparent.] A. Dotsch's [1] bacteriologic investigations of 98 cases of serpent ulcer confirm absolutely the conclusions of Uthoff and Axenfeld, who found the pneumococcus responsible for this clinical picture. In view of these things, it would seem that pneumococcus ulcer is the proper designation for this variety of corneal trouble.

AFFECTIONS OF THE LENS.

Incipient Cataract.—Concerning the treatment of immature cataract, G. E. de Schweinitz [2] observes that certain lenticular opacities, generally situated in the inferonasal quadrant of the lens, do not handicap the patient's ocular abilities, are practically stationary, and may be designated as nonprogressive. Other lens opacities undoubtedly depend on disturbances of the choroid apart from actual active choroiditis, and their progress is sometimes apparently checked by optical, local, and general measures, which, while correcting the choroidal congestion, do not remove already formed opacities. Class 3 embraces the opacities seen in diabetes mellitus, nephritis, lithemia, and arteriosclerosis. All lenticular opacities, except those which belong to the so-called nonprogressive group, should be regarded as indications for a thorough investigation of the patient from the general as well as from the ocular standpoint, and for optical, local, or medicinal treatment according to the findings. Finally, the extraction of unripe cataracts is preferable to any of the ordinary operations for ripening cataracts.

Method of Operating.—Pagenstecher [3] allows the behavior of the iris after opening the anterior chamber to decide whether iridectomy shall be done or not. If it shows no disposition to retract, iridectomy is performed. After the extraction he spreads pure ichthyol over the lids and lays over this a piece of gauze saturated with liquid paraffin, over which is placed some cotton. The whole is kept in place by a wire shield, fixed in specially devised spectacle frames that he has used for 10 years with success. He does not believe in the so-called open treatment of cataract patients. H. Power [4] feels that depression or reclination under antiseptic precautions is justifiable and even preferable to extraction when there is an extremely small palpebral fissure and a deep-set eye, also in those greatly enfeebled by age, in chronic unyielding conjunctivitis, and in deafness, chronic bronchitis, cases of fluid vitreous, and in lunatics, imbeciles, and idiots. [The return to the old operation is not to be recommended. The danger of iridocyclitis and of

[1] Die ophth. Klinik, Oct. 5, 1900.
[2] Jour. Am. Med. Assoc., Dec. 8, 1900.
[3] 44. Jahresber. der Augenh. f. Arme.
[4] Brit. Med. Jour., Oct. 26, 1901.

sympathetic inflammation from the presence of a foreign body (the lens) in the vitreous chamber is real and ought not to be incurred. Far better is it to follow the plan of administering general anesthesia.] J. Silfoast [1] enumerated the contraindications for simple extraction as follows: Glaucoma, narrow unyielding pupil, luxation of the lens; if the iris cannot be completely replaced or when it shows a tendency to prolapse; when narcosis is necessary, and if the patient has a cough. S. D. Risley [2] operates by the simple method when there is no history or discoverable evidence of uveal disease, a promptly acting iris, a pupil that dilates readily under a mydriatic, and a ripe cataract. The contraindications are previous asthenopia, discolored or sluggish iris, a dark lens, capsular involvement, and slow ripening. J. Haddens [3] describes extraction of cataract through the posterior chamber by means of an incision in the sclera 1 millimeter back of the corneoscleral margin. The advantages claimed are prevention of secondary cataract, better vision, and no deformity through iridectomy. To the 40 cases reported some little time ago, Vacher [4] adds 40 more similarly operated on by the bridge method. The advantages of the method are the impossibility of reversal of the flap, the rarity of iris prolapse, the early removal of the dressing, and the lessening of postoperative astigmatism.

In the course of a very few years the **surgeons of India** have operated on nearly **25,000 cases** and their results have been excellent.[5] Pope says it often happens in the Madras hospital that a run of 300 successful cases occurs, and remarks that following such a remarkable run 4 or 5 consecutive cases will fail, either from suppuration or iridocyclitis. Pope uses atropin before operating. Lewtas, [6] out of 147 operations, did iridectomy in 33 and then only because of some untoward circumstance. The tendency among all the Indian operators is to extract without iridectomy. Smith [7] not only operates without iridectomy, but in all uncomplicated cases extracts the lens within its capsule (1650 cases with very good results). In another paper [8] Smith gives the statistics of 1804 extractions. Of these, 692 were extraction of the lens within its capsule and without iridectomy and 78 with iridectomy. In the former there was iris prolapse in 1 % and in the latter in 2 % of the cases. There was escape of the vitreous in 14 % of these 770 cases, as against 8.5 % in the 1034 cases in which capsulotomy was done. Iritis occurred in $\frac{1}{3}$ of 1 % of the extractions of lens and capsule, as against 1.3 % of those cases with capsulotomy. Smith claims that the operation is as simple as any other, that it leaves nothing behind to become opaque, and no foreign matter to set up iritis.

Spontaneous Absorption.—Another instance of spontaneous absorption of cataract is reported, this time by Trousseau.[9] An iridectomy had previously been done for the relief of glaucoma, following which the lens gradually disappeared. The patient was 55 years old and the

[1] Ann. Ophth., Apr., 1901. [2] Sect. Ophth., Am. Med. Assoc., June, 1901.
[3] Klin. Monatsbl. f. Augenh., Nov., 1900. [4] La Clin. Ophtal., Nov. 10, 1900.
[5] Lancet, Aug. 10, 1901. [6] *Ibid.* [7] *Ibid.*
[8] Indian Med. Gaz., in Ann. Ophth., Oct., 1900.
[9] Ann. d'Oculist, Mar., 1901.

lens soft, several months being necessary for the completion of the absorption process. With +12 D. the patient had $\frac{2}{3}$ vision. [The possibility of traumatism to the capsule during the performance of iridectomy is worth considering, although we must admit even after this accident that the absorption of a lens in a man of 55 is unusual.]

Psychic Symptoms.—W. C. Posey [1] concludes that the delirium after operations on the eyes is largely psychic, and he agrees with Parinaud that it is due to the preoccupation of the patient prior to and after the operation. He advises the free and repeated administration of chloral and bromids. Nothing is to be gained, in his opinion, by the removal of the bandage or withdrawal of atropin.

Death.—Trousseau [2] records death after cataract extraction, remarking that if an aged patient becomes agitated or delirious, or if the tongue becomes dry and the urine scanty or suppressed, there is cause for alarm.

Congenital Cataract.—From a comparative study of the structure of the hypoplastic teeth usually associated with lamellar cataract, N. G. Bennet [3] infers that lamellar cataract is a disease of early infantile life due to some derangement of the general health, most probably some error in diet or nutrition. It may also be the result of contraction of the nucleus of the lens some time *after* birth. By freely breaking up the lens, slitting the capsule vertically and horizontally and allowing the aqueous *slowly* to escape, instead of retaining it according to the present method of operating by discission, P. Dunn [4] claims to avoid the risk of increased tension and to hasten the absorption of lens matter. [Several years ago the same suggestion was made by E. Jackson. It must be admitted that improvement in the method of treating congenital and other soft cataracts is to be desired. The delay is tedious, several weeks or months elapsing before the case is cured, more than one needling is required, and the risk of iritis and of increased tension is considerable. In soft cataracts other than congenital we have adopted the method of linear extraction, and have been well satisfied with the results.]

After-cataract.—In a discussion on secondary cataract before the British Medical Association, E. D. Bower [5] said the remarks of Jessop, Power, and Marshall represented entirely his own feelings, which were those of intense anxiety when approaching any operation for secondary cataract. One question was whether the bad results that sometimes follow were really due to sepsis. He felt sure that the general health was responsible for some of the failures.

Electric Effects.—K. Kiribuch's [6] 54 experiments to determine the effect of electric shocks on the eye show that lens clouding begins in a few hours together with marked changes in the uveal tract and optic nerve, all of which he attributes, first, to the electrolytic action, and second, to the action of the ultraviolet rays. Three more

[1] Phila. Med. Jour., Sept. 15, 1900.
[2] Ann. d'Oculist, Mar., 1901.
[3] Lancet, Nov. 17, 1900.
[4] Lancet, Dec. 29, 1900.
[5] Brit. Med. Jour., Nov. 2, 1901.
[6] Arch. f. Ophth., Bd. L, No. 1.

cases of cataract after lightning stroke are recorded by Preindelsberger.[1] In one of the cases, a man of 24, only one eye was affected, to which vision was restored by a successful extraction.

DISEASES OF THE IRIS.

G. C. Harlan[2] speaks of **miosis and ptosis from paralysis of the cervical sympathetic,** studied in a man of 22, who 5 years before had been wounded by a rifle ball in the right cervical sympathetic region. The ball evidently had just grazed the carotid artery. The right pupil was 2.5 millimeters, the left 4.5 millimeters—under weak illumination R. 5 millimeters, L. 7 millimeters, which relation was not altered when homatropin was used. Vision was not affected. [This report is a "traumatic" substantiation of the statement that miosis follows removal of the cervical sympathetic gland in glaucoma.]

Von Michel[3] analyzes the causes underlying 84 cases of **primary iritis** and finds that (1) women are more prone to the disease than men; (2) chronic nephritis was coexistent in 29 cases, tuberculosis in 31, disease of the circulatory apparatus in 13, syphilis in 5, and other diseases in 6 cases. [One is amazed at the small percentage of cases associated with lues.] The logical inference growing out of von Michel's analysis is that primary iritis exists almost exclusively with some general affection calling for examination of all the organs of the body and of the kidneys in particular. In acute iritis R. W. Doyne[4] employs radiant heat derived from an ordinary 16 candle-power incandescent light. The patient sits by its side with closed lids, keeping the eye as close as can be tolerated. The sittings vary in length—5 minutes daily for acute, less frequently for chronic iritis. The whole side of the face gets intensely hot, but giddiness is not complained of. The patient sits in the dark for 20 minutes after each application. The value of the treatment is increased by gentle massage and cold douching subsequently. [If Doyne desires dry heat alone the object is quite as well accomplished by the little tin Japanese pocket stoves now in general use in this country. But there may be as yet unknown x-ray effect to electric light so used for which there can be no substitute.] The author has been surprised at the results in most acute and some chronic cases.

Griffin[5] removed a **leukosarcoma of the iris** from a patient 19 years of age. The tumor was dense, white, and nonvascular. Sarcoma at this period of life is unusual. Cysticercus of the iris is extremely rare, at least in America and in literature. Montano[6] extracted one from a woman aged 32 by iridectomy with subsequent vision of $\frac{6}{10}$. Only 20 other cases have been reported. Cases of cyst of the iris following traumatism, more especially a perforating wound of the cornea, are not infrequent.

[1] Wien. med. Woch., No. 13, 1901.
[2] Ann. Ophth., Apr., 1901.
[3] Münch. med. Woch., June 19, 1900.
[4] Tr. Ophth. Soc. of United Kingdom, 1900.
[5] Brit. Med. Jour., Oct. 3, 1900.
[6] Anales de Oftal., June, 1901.

Under cocain W. J. Collins attempted to remove a **traumatic cyst** that collapsed as soon as touched with the knife. He thinks it was an iris cyst, not an epithelial implantation, but due to distention of a cleft in the iris.

C. S. Bull's [1] contribution to the subject of **tuberculosis of the iris** is an exhaustive review of this whole subject well worthy of deep study. He recognizes two forms, one rare, generally ending in spontaneous cure, the other usually going on to perforation and phthisis bulbi. The latter variety is to be expected in patients hereditarily disposed to the disease. Tuberculosis of the iris should be recognized early in order that other organs of the body may be saved from infection and the life of the patient preserved. The surest means of diagnosis is inoculation. When this is impracticable, we must rely upon the clinical signs, such as the formation in the iris of round yellow nodules, single or multiple, that have a tendency to grow forward into the anterior chamber, ciliary injection, intense pain, synechiæ. The nodules eventually break down into large, soft, brownish masses. The ball becomes filled with tuberculous matter and even the orbit may become involved, or the cornea ruptures and the ball shrinks. W. F. Mittendorf [2] calls attention to the peculiarity that in his own cases and in those reported the left eye is the one first attacked. [This is merely a coincidence. We have seen a case involving the right eye only.] The treatment is early enucleation.

Perforating wounds of the iris do not close if no iritis is set up. Aschein [3] reports 18 cases of transfixion of the iris in the treatment of closure of the pupil. In all there was forward bulging of the iris due to occlusion of the pupil, and increased tension. An incision is made through the cornea, 0.5 millimeter from its outer margin, with a broad Graefe knife, the handle being so held that the blade lies parallel to the surface of the iris. The knife is now passed through the prominent iris and brought out again near the nasal periphery, where it counterpunctures the cornea. Five eyes previously operated for cataract and 8 other nonaphakial eyes were so treated. In 3 cases the result was not permanent, because old iridocyclitis again broke out. In certain conditions transfixion seems preferable to iridectomy.

DISEASES OF THE CHOROID.

In the report of 6 cases of **metastatic choroiditis** occurring in the course of pneumonia due to grip, Bull [4] describes the symptoms thus: Pain in the eye and head, intense congestion with the usual manifestations of choroiditis, iridochoroiditis, and rapid and total loss of sight. Small foci of disease appear in the choroid and rapidly coalesce, giving a yellow fundus reflex. Enucleation is not advisable in the first stage, especially if the purulent inflammation has extended to the tissues of the orbit outside of the ball. Propenko [5] speaks of a metastatic choroid-

[1] Med. Rec., Dec. 8, 1900.
[2] Med. News, May 25, 1901.
[3] Arch. Ophth., Sept., 1900.
[4] Med. Rec., Aug. 31, 1901.
[5] Russian Messenger of Ophth., Feb., 1900.

itis that developed as one of the symptoms of pyemia after an operation. Microscopic examination of the enucleated eye showed that the metastasis resulted from primary infection of the choroid and not from infection of the retina.

Alter [1] places strong emphasis on the presence of melanin in the urine in cases of melanosarcoma as an indication of metastatic involvement. He claims that this finding is prognostic of a fatal termination. He says that not more than 15% recover. The round-celled, highly vascular variety is almost surely fatal, while the spindle-celled gives a much more hopeful outlook. The case of **sarcoma of the choroid** studied by W. C. Posey and E. A. Shumway [2] in a woman aged 70 presented the following unusual features: It was of the alveolar type (intravascular angiosarcoma), attended very early by glaucoma with acute optic nerve degeneration, and occurred at an exceptionally advanced age.

C. B. Taylor,[3] in speaking of "sometimes successful treatment of cases of **apparently incurable blindness,**" mentions some remarkable cures. For example, a man of 35 had become entirely blind from optic nerve atrophy following optic neuritis. After the daily application of a strong galvanic current, continued for weeks, vision was restored. A young woman blind from iritis and diffuse scleroderma, "the eyes simply opaque masses, recovered perfectly, sees very well indeed to read and at a distance," by taking large doses of mercury for 4 years. A peer, blind for a long time from iridochoroiditis and effusion into the vitreous, who had been declared incurable by the most eminent men of the day, recovered in a month sight as good as he had ever enjoyed in his life, after galvanism, large doses of mercury, massage, pilocarpin, and derivatives! Taylor revives the remedies lately fallen into disuse, such as bloodletting, derivatives, setons, and issues, and urges their more frequent employment. [Verily, the age of miracles has not yet passed.]

Pilocarpin sweats, in the treatment of **inflammations of the interior of the eye,** notably purulent iritis, interstitial keratitis, vitreous opacities, and retinochoroiditis, have been of value in the hands of H. F. Hansell.[4] In order to be effective the treatment should be thoroughly carried out and prolonged for 2 or 3 weeks. The sweating, inaugurated by the hypodermic injection of pilocarpin nitrate, given immediately after a hot bath, is encouraged for 2 to 3 hours by hot blankets and bottles. Its good effect is particularly marked in nonsyphilitic cases, but in individuals who are subjects of syphilis it is useful in permitting the long use of mercury without ptyalism. The new operative procedure for treating inflammation of the posterior part of the eye, described by S. B. Allen,[5] consists in the opening of Tenon's capsule and the injection of hot water. This method was suggested by the great efficacy of heat in relieving pain and inflammation in the anterior part of the eye.

[1] Toledo M. and S. Reporter, Mar., 1901.
[2] Ann. Ophth., Jan., 1901.
[3] Lancet, Apr. 27, 1901.
[4] Therap. Gaz., Aug. 15, 1901.
[5] Med. Rec., Sept. 21, 1901.

SYMPATHETIC OPHTHALMIA.

The result of Selenkowsky's [1] experiments on dogs and rabbits seems to show that **sympathetic inflammation in man is caused by toxins** which, forming in the injured eye, pass, by way of the subvaginal spaces of the optic nerve, to the healthy eye and there set up trouble. La R. Guibert [2] details 4 cases of sympathetic ophthalmia in support of Panas' theory that some general autointoxication is necessary for the establishment of sympathetic disease.

Abadie [3] describes a case of sympathetic ophthalmia, 14 years after enucleation of the eye primarily affected, cured by the injections of 3 or 4 drops of a 1 % solution of mercury cyanid injected into the stump of the enucleated eye. He says the optic nerve had been probably invaded by the primary infectious process, but the **infection had lain latent.** [This is a very remarkable case. Other instances of sympathetic inflammation following months or years after enucleation of the injured eye have been reported, but in all or nearly all the sound eye was destroyed by the same inflammation that caused the loss of the first, namely, local manifestation of systemic disease.] G. H. Burnham [4] strongly recommends the combined treatment continued for months by potassium iodid and mercury with pilocarpin injections for deep-seated ocular inflammations and sympathetic ophthalmia. The treatment owes its efficacy, he says, to its power of arousing to excessive activity the physiologic processes in diseased tissues. Heuse [5] and Gifford [6] commend sodium salicylate in daily amounts of about 65 to 75 grains. The former offers in evidence 3 cases in which signal success followed its use when all other means had failed.

GLAUCOMA.

[The majority of papers published during the past twelve months deal with the treatment. Writers and practitioners seem to be satisfied that the causes, symptoms, and pathology are well enough understood to obviate the necessity for further research in these directions. This is a pity ! The knowledge that the filtration angle is closed, that the optic papilla is cupped, and that the tension is supranormal may constitute fundamentals, but there is a large unknown field yet to be traversed, comprising the causative relations of general affections, such as gout, influenza, menstrual disorders, racial influences, sex, size of ball, refraction, etc. Happily the year's glaucoma literature is not altogether barren on these subjects.]

De Schweinitz [7] traces the **causal relationship between influenza and glaucoma.** He believes the axial neuritis frequently induced by the former is the starting-point for the glaucomatous excavation of the nerve head.

[1] Thesis, St. Petersburg, 1900.
[2] La Clin. Ophth., Mar. 25, 1901.
[3] Rev. Gen. d'Ophth., Paris, Sept., 1900.
[4] Lancet, Apr. 27, 1901.
[5] Centralbl. f. prakt. Augenh., Apr., 1901.
[6] Ann. Ophth., Jan., 1900.
[7] Ophth. Rec., Feb., 1901.

Daulnoy's [1] investigations support Abadie's theory that acute glaucoma is probably a **lesion of a part of the bulbar center,** producing dilation of the orbital arteries and therefore a reflex contraction of the choroidal muscle which brings about the hypertension. Iridectomy acts, therefore, very well in acute and subacute glaucoma with corneal disturbance and absolute remission between the attacks, probably because of the destruction of the iridal plexus. In chronic simple glaucoma the bulbar lesion acts more especially upon the trophic fibers, hence iridectomy is without effect. In such, if prolonged vigorous treatment with miotics does not help, sympathectomy should be tried.

Mydriatics.—J. Hinshelwood [2] records acute glaucoma occurring after using 2 drops of cocain solution in the eyes of a woman aged 50, who had 6 diopters of hyperopia. Eserin controlled the symptoms temporarily and iridectomy permanently. Since holocain is a great pain reliever and enhances the action of eserin, Hinshelwood urges its use instead of cocain in all doubtful cases. Another instance of acute glaucoma following the instillation of a single drop of homatropin is recorded by G. H. Shears. [3] A woman of 52, a hyperope, came one week after the use of homatropin with acute glaucoma and could only count fingers. Eserin and leeches were unavailing, but iridectomy restored sight and tension in 10 days.

Most ophthalmic surgeons rely upon palpation in the determination of the **tension of the ball.** Although tenomometers have been devised from time to time, they have never been generally adopted. P. Gradedigo [4] offers a tenomometer for which he claims easy application, firm contact, and automatic registration of the most delicate changes. To get perfect readings the patient must lie down and a few drops of a very weak cocain solution be used before applying the tension measurer.

Ellett's [5] idea of the **pathology** is that the filtration angle is closed, or open and choked with debris. The vessels of the iris and ciliary body may be sclerosed, ruptured, or the seat of hyaline degeneration. There may be inflammatory infiltration, posterior synechiæ, ciliary engorgement, hemorrhage into the ciliary body, or atrophy. In the choroid venous engorgement is the most frequent change. In the retina vascular degeneration is almost constant; that is, sclerosis and hyaline degeneration. The optic nerve has a classic glaucomatous cup. The vitreous may contain blood. Hemorrhagic glaucoma is a local expression of a general condition and not truly a glaucoma. The prognosis is bad. The treatment in the first period is by sedatives, myotics, moist heat, ergot, and potassium iodid, potassium bromid, and chloral hydrate; posterior sclerotomy or enucleation. It is always associated with and related to general arterial degeneration, which in turn is often due to a chronic kidney lesion.

W. C. Posey, [6] in describing a case of **hemorrhagic glaucoma,** quotes de Bourgon as follows: "As a result of the initial general vas-

[1] La Clin. Ophth., Mar. 13, 1901.
[2] Ophth. Rev., Nov., 1900.
[3] Lancet, Feb. 3, 1901.
[4] Ann. di Ottal., vol. XXIX.
[5] Ann. Ophth., Oct., 1897.
[6] Jour. Am. Med. Assoc., Dec. 8, 1900.

cular disturbance it appears that a diminution in the circulation of the blood follows, favoring hemorrhages which are rather the action of diapedesis than of rupture of the vessel walls. The majority of observers agree that the most constant lesions are found in the blood-vessels, more especially those of the retina, such as miliary aneurysms, hyaline and amyloid degenerations, periarteritis and sclerosis."

Treatment.—Wiekerciewicz [1] thinks eserin should be used in ordinary cases in ½ grain to the ounce solution. In glaucoma fulminans, when a **rapid effect** is desired, a 2½ grains to the ounce eserin salve locally, with morphin hypodermically, is the best treatment preparatory to iridectomy. If the pupil be small and the tension plus, he prefers 10 grains to the ounce pilocarpin solution as routine treatment. In simple chronic glaucoma with occasional acute exacerbations he reposes the utmost confidence in the following:

℞.	Eserin sulph.	1 gr.
	Pilocarpin muriat.	2 "
	Cocain muriat.	1 "
	Aquæ dest.	1½ f℥.

De Wecker [2] regards actual or relative increased tension as the essential feature of **chronic simple glaucoma,** but as this part of the diagnosis turns on the acuteness of individual tactile sensation, it cannot always be determined; therefore the use of miotics assists much in the diagnosis. However, properly performed sclerotomy is more certain and in some cases has seemed to relieve permanently. Iridectomy, he asserts, presents the most positive opposition to the disease, and its value is much enhanced when done subsequent to sclerotomy. Cross [3] says that iridectomy is the operation of choice in simple noninflammatory glaucoma, and although improvement is not always immediate, it will ultimately take place. [We believe that iridectomy is more valuable than other operations, but that recovery ultimately ensues is a matter of extreme doubt.] Abadie [4] lays down the rule that in acute and subacute glaucoma showing corneal involvement, and in the intermittent relapsing forms of the disease, iridectomy is the main reliance. The same author,[5] 6 months later, calls attention to the fact that in those cases of glaucoma which are favorably influenced by an iridectomy the pupil is always dilated and remains so after the operation. This is not apt to be the case in chronic simple glaucoma, hence the pupillary status he considers a safe guide as to whether iridectomy or ablation of the cervical ganglion of the sympathetic offers the greater hope of relief. De Wecker [6] prefers anterior sclerotomy to be followed later by iridectomy, because the former removes from iridectomy the dangers which it undeniably presents in a certain number of cases of recent glaucoma. S. Snell [7] recites a case in which vision fell to counting fingers. Prompt iridectomy restored the vision. W. Wagner [8] insists that iridectomy is far supe-

[1] Klin. Monatsbl. f. Augenh., July, 1901.
[2] Arch. d'Ophth., July, 1901.
[3] Brit. Med. Jour., Oct. 6, 1900.
[4] Arch. d'Ophth., Nov., 1900.
[5] Arch. d'Ophth., Mar., 1901.
[6] Ann. d'Oculist, Nov., 1900.
[7] Ophth. Rec., Feb., 1901.
[8] Klin. Monatsbl. f. Augenh., Aug., 1901.

rior to all known methods of treatment of glaucoma, and C. A. Oliver [1] believes the best permanent results in hemorrhagic glaucoma are obtained after *slowly* performed iridectomy. Haab [2] says, concerning hemorrhagic glaucoma, that the less serious the intervention, the better the results; hence sclerotomy is to be preferred. **Indications for Resection of the Cervical Sympathetic Ganglion:** If in chronic simple glaucoma, in spite of miotics, vision continues to fall, or in failure to cure in the acute and chronic forms by iridectomy (Abadie [3]); in glaucoma simplex, in inflammatory glaucoma when iridectomy has failed, in hemorrhagic glaucoma early in the disease, in absolute glaucoma with pain in preference to enucleation (H. J. Williams [4]); in chronic simple and absolute glaucoma (Schimanowsky [5]); in secondary glaucoma fulminans after iridocyclitis (A. L. Whitehead [6]). **Results of Resection:** The later result of H. W. Dodd's first case of chronic glaucoma reported a year ago, as also that of his second case [7] similarly treated, does not lead him to regard the operation as curative. In both cases the immediate effect was good, tension diminished, pupil contracted, vision improved, but after several months the conditions were the same as before operation. In a case in which double iridectomy had been done years before, J. Mullem [8] operated for chronic inflammatory glaucoma, with the result of increasing the size of the fields and reducing pain. The improvement was, however, only temporary, vision again declining and the pain returning. Mohr [9] observed in 3 cases narrowing of the pupil, lowering of the tension, and marked widening of the field. In Schimanowsky's case [9] vision had risen in 2 months in one eye from $\frac{1}{10}$ to $\frac{4}{10}$. A. L. Whitehead [9] noticed that the tension sank immediately from $+3$ to $+\frac{1}{2}$, and this remained permanent. The patient could count fingers at 18 inches. In Coover's case [10] the results were: tension lowered almost to normal; contracted pupil; increased vision and visual field, all of which gains were swept away by a subsequent recurrence of the disease 3 months later. The author believes this operation of service in arresting the disease in the early stages only. F. F. Burghard's [11] experience in 3 cases is valuable not so much as concerns treatment as for the careful study of the after-symptoms produced by the removal of the ganglion. Three symptoms were found constant: ptosis, severe pain in the head on the operated side, and congestion of the facial vessels on that side. The ptosis was immediate and marked and lasting in all, although it improved a trifle as time went on. The headache was variable in degree and duration. Foremost among the inconstant symptoms was the variation in the intraocular tension, being decidedly marked in the first case and absent in the other two. [It is rather striking that in 2 of the cases there was no enophthalmus and that in the remaining one there was exophthalmus!]

[1] Jour. Am. Med. Assoc., Dec. 8, 1900.
[2] La Presse Méd., Sept. 24, 1900.
[3] Arch. d'Ophth., Nov., 1900.
[4] Med. News, Apr., 1901.
[5] Russian Messenger of Ophth., June, 1900.
[6] Lancet, July 6, 1901.
[7] Lancet, Mar. 23, 1901.
[8] Am. Med., June 22, 1901.
[9] Klin. Monatsbl. f. Augenh., Mar., 1900.
[10] Phila. Med. Jour., Mar. 16, 1901.
[11] Brit. Med. Jour., Oct. 20, 1900.

DISEASES OF THE RETINA.

Detachment.—The following cases are reported by Winselmann:[1] A man of 40, the subject of chronic iridochoroiditis, had been blind in his right eye from detachment for 3 years and had become blind on the left side a few days before the author saw him. Vision equaled hand movements at 3 feet in the right and light perception in the left. The ophthalmoscope showed total funnel-shaped detachment of the retina in both eyes. The patient was put to bed and 30 minims of salt solution injected under both conjunctivas. The next morning the patient said he could see as well as ever, and a glance with the ophthalmoscope showed that the retina had reattached itself. Nine injections were given in, all every other day. When the patient was discharged, the vision of the right eye was $\frac{6\frac{1}{2}}{10}$ and counting fingers at 2 feet in the left eye. No detachment could be made out. The injections were continued, and some time later the vision equaled $\frac{6}{7\frac{1}{2}}$ R. and fingers at 3 feet L. The second was a case of traumatic localized detachment with vision of $\frac{6}{25}$. After 6 injections of 60 minims each of a 2% salt solution, vision equaled $\frac{6}{16}$. The last case was one of idiopathic detachment with vision of $\frac{6}{24}$. Injections and compression bandages were ordered. The following day the patient had full vision and no detachment was to be found. Some weeks later the man returned to work. The cure has lasted 13 months in the first case. Time alone can tell of the permanency of the cure in all the cases. [These results are startling and should stimulate renewed interest in what has always been viewed as a practically hopeless affection.] In 23 cases A. Staerkle[2] used 2%, 4%, and 10% solution of salt injected subconjunctivally. He finds the injections painless and harmless, and that they materially foster the absorption of pathologic products in proportion to their concentration. In 3 cases *lasting* reapposition of the retina was observed, with improvement of vision in 5. Another instance of the value of salt injection is that of H. Ziegner.[3] A man aged 52 had **idiopathic hemorrhage** between the retina and vitreous humor. Complete absorption of the clot in the unusually short period of 3 months followed repeated injections. Detachment was found by L. Gabler[4] in 0.5% of 76,000 cases. Of the 120 cases coming under his notice, nearly all were the subjects of high myopia. Only 44 cases remained under observation for any length of time, of which number 12 were treated by scleral puncture, 11 by iridectomy [why?], 7 by a combination of both methods. Only 3 cases were improved by scleral puncture, 5 by iridectomy, 1 by the combined method, and internal medication he found of no effect whatever.

Night-blindness.—W. J. Buchanan[5] states that night-blindness with xerosis of the conjunctiva is common in India. He reports 3 cases, each of 2 months' duration, all of which were given daily about 8

[1] Die ophth. Klinik, Feb. 5, 1901. [2] Inaug. Diss., Basel, 1900.
[3] Berlin. klin. Woch., Apr. 1, 1901. [4] Pester med.-chir. Presse, Nov. 4, 1900.
[5] Ann. Ophth., Apr., 1901.

ounces of goats' liver fried in oil and spices and no drug treatment. All recovered within 2 weeks. [Unfortunately, no data as to vision, refraction, and retinal status were given, which takes from what might be an important communication most of its value.]

Concussion.—H. A. Beaudoux [1] reports a case in which the symptoms of concussion of the retina as described by Denig are illustrated. A man was struck on the right side of his head a powerful blow. The same night sight became dull and during the next few days became so bad that only a small portion of the extreme periphery of the field retained its function. The ophthalmoscope showed a large number of white patches in the retina and spots of choroidal hemorrhage. The retinal veins were dilated from paralysis of their walls. Recovery ensued in several weeks under pilocarpin sweats, potassium iodid and galvanism. L. A. W. Alleman [2] gives a clinical picture of the retinal changes due to **cerebral concussion.** Visual acuity is usually lowered; the impairment may be slight or the eye may be almost blind; in most cases the patient complains of a blur at the fixation-point; the visual field, however, rarely shows any defect. Improvement in vision is rapid. Retinal edema is a constant symptom, the disc is indistinct in outline, the retinal vessels are tortuous, and hemorrhages are frequent.

S. Jackson's [3] efforts to **photograph the fundus** are, according to his own statement, failures. [His apparatus is ingenious and simple, and it is hoped that he will not be discouraged from future attempts.]

A peculiar **diffuse punctate condition of the fundus** is described by E. A. Shumway [4] as occurring in a married colored woman of 35, subject to migraine. He located the lesion in the pigment cells and thinks it is probably colloid.

Webster [5] records enucleation for **glioma of the retina** 12 years ago in a boy aged 2, who to-day shows no evidence whatever of metastasis or recurrence.

DISEASES OF THE OPTIC NERVE.

Anatomy of the Chiasm.—Bach [6] summarizes the results of his experimental work in determining the decussation in the chiasm, as follows: In the pigeon there is total decussation; in rabbits, cats, apes, and men about one-third of the fibers do not cross; there is apparently no direct communication between the optic fibers going to the corpora quadrigemina and the oculomotor nucleus, nor between the optic fibers and the centers in the cervical cord and medulla that govern the movements of the pupil. The pupillary fibers that decussate in the chiasm decussate again farther back in the brain; this is proved by the homolateral pupillary reaction that occurs in animals that have total decussation of the optic nerves. The descending pupillary reflex tract from

[1] Ophth. Rec., Sept., 1901.
[2] Am. Med., Aug. 24, 1901.
[3] Jour. Am. Med. Assoc., June 1, 1901.
[4] Ann. Ophth., Oct., 1901.
[5] N. Y. Med. Jour., Nov. 3, 1900.
[6] Deut. Zeit. f. Nervenh., Bd. XVII, H. 5 u. 6.

the primary optic ganglia to the medulla is probably a portion of the fillet; the ascending tract to the oculomotor nucleus is almost certainly the posterior long tract. It is not necessary to accept an intimate anatomic relation between the cells for the sphincter muscle of the pupil in the oculomotor nucleus and the various centers.

Choked Discs.—A. Merz [1] concludes that intracranial increased pressure continued for a certain length of time is capable, alone, of producing choked discs. It leads to compression of the venous sinuses of the brain, disturbing venous circulation in the retina. To this is added stasis of liquid in the subvaginal spaces and compression of the vessels running through the nerve sheath to the papilla. Finally, the optic nerve is compressed by disturbed circulation in its own lymphatics, leading to edema of the fibers and again compression.

Thyroid Extract a Cause of Optic Neuritis.—Coppez [2] reports 5 cases, 4 of them in women, in which prolonged thyroid treatment for obesity produced well-marked optic neuritis occurring several months after beginning the treatment, but then progressing very rapidly, with reduction of vision to $\frac{1}{10}$ in a few weeks.

Adenoids a Cause.—Koenigshoefer [3] records the case of a young woman who complained of increasing dimness of vision in the right eye. She had optic neuritis, disturbance of color-sense, and limited field. The left eye was normal. She had long been a sufferer from nasal catarrh, and the pharyngeal vault was choked up with large adenoid vegetations. She had no constitutional disease. The removal of the adenoids was followed in a short time by recovery from the optic neuritis, restoration of the field, and normal acuteness of vision after mercurial inunctions, potassium iodid, and other remedies had been tried, vainly. The adenoids choked up the circulation in the veins of the right orbit, inducing edema and exudation [a plausible explanation].

Toxic Amblyopia.—A. W. Henry [4] reports toxic amblyopia (vision $\frac{6}{8}$, with correction) with central scotoma for red, as found in a man of 57, who used no tobacco, drank no alcohol, but drank **tea** tremendously. Complete recovery followed withdrawal of the tea and proper treatment. According to de Schweinitz, methyl alcohol [5] may, when absorbed in considerable quantities through the lungs by inhalation of the fumes and through the skin, produce sudden blindness that in the case described became permanent. He advises that workers in this liquid and their employers be warned of its dangerous nature. A. Moulton [6] adds 2 cases of blindness from the absorption of **wood alcohol.** They presented the usual symptoms, namely: on the second or third day nausea, vomiting, headache, and dizziness, followed in a short time by visual disturbances, total blindness ensuing in 12 to 48 hours; partial recovery succeeded by permanent total blindness, central scotoma, and atrophy of the papilla. To the 8 cases of amblyopia from **iodoform** poisoning

[1] Arch. Ophth., July, 1901.
[2] Editorial, Med. Press and Circ., Mar. 8, 1901.
[3] Ophth. Klinik, Jan. 5, 1901.
[4] Ophth. Rev., Dec., 1900.
[5] New Orl. M. and S. Jour., June, 1901.
[6] Sec. of Ophth., Am. Med. Assoc., June, 1901.

already recorded, W. M. de Vries [1] adds that of a 9-year-old boy, who in the course of treatment for spondylitic kyphosis and abscess had 7500 grains of iodoform injected into the abscess-cavity in 4 months, which by cumulative action produced nystagmus and amblyopia. Recovery was prompt on cessation of the injections. H. Fisher [2] regards the central amblyopia in **nicotin** poisoning as due to interruption in the transmission of those impulses which have to pass through the ganglion cells upon which the alkaloid acts. This enables us to explain more satisfactorily than hitherto why direct vision suffers out of all proportion to indirect vision in this affection. J. H. Parsons agrees in the main with Fisher,[3] and pronounces the action of nicotin a double one: (1) vascular, causing constriction of the arteries, and (2) paralytic, either to the cone fibers or the inner granules or both. The hitherto accepted idea that Cubans were free from tobacco amblyopia is exploded by C. E. Finlay.[4] In 95 cases of tobacco amblyopia, 75 were Cuban or Spanish whites, mostly males, and nearly all alcohol as well as tobacco consumers. Three cases of tobacco-alcohol amblyopia, exhibiting retinal hemorrhages, are presented by W. Zentmayer,[5] who believes that the hemorrhages resulted from giving way of the alcoholically weakened muscles under the increased tension caused by the presence of the inflamed nerve-fibers.

Glioma.—M. W. Zimmerman and B. K. Chance [6] present in full the details of a circumscribed glioma (diagnosed under the microscope) removed by enucleation 4 years ago from a girl aged 5. Since then she has passed through grave diphtheria and is to-day a fine, healthy child.

Treatment of Tabetic Atrophy.—Demicheri [7] agrees with de Wecker that **mercury** is positively harmful in tabetic atrophy of the optic nerve. Recently he has found that sodium nitrate sometimes improves vision and increases the field. Fifteen drops of a 6% solution is used subcutaneously 5 times per week, and 5 to 10 drops under the conjunctiva every other day. In one case the subconjunctival injections alone produced as good results as the combined method. Improvement should begin within a week and reach its maximum in about 2 months.

INJURIES.

By Lime.—Stutzer [8] advocates the immediate treatment of lime injuries by means of copious washings with clean water continued for a considerable length of time. [Probably no treatment can save an eye when exposed to burning by lime. The traumatism is immediate and the damage is already done before any remedies can be applied. The washing of which Stutzer speaks is useful to clean the eye and remove any particles of lime or dust that might be the source of irritation.] Schmidt-Rimpler,[9] who has had an experience of 56 cases in 10 years

[1] Weekbl. v. Geneerk., Dec. 22, 1900.
[2] Ophth. Rev., June, 1901.
[3] Ophth. Rev., June, 1901.
[4] Arch. Ophth., May, 1901.
[5] Ann. Ophth., July, 1900.
[6] Ann. Ophth, July, 1901.
[7] La Clin. Ophth, Oct. 25, 1900.
[8] Deut. med. Woch., Sept. 3, 1900.
[9] Berlin. klin. Woch., Sept. 3, 1900.

in the Göttingen clinic, among which 20 patients became blind, recommends the removal of the particles of lime by wiping out the conjunctival sac with a cotton wad saturated with oil. If oil cannot be obtained, he uses water. W. C. Posey [1] approves of flushing with water and then touching all points of the conjunctiva with olive oil or diluted vinegar.

Contusions.—Common lesions of contusions are luxation or subluxation of the lens, leading to obliteration of the filtration angle and glaucoma, iridodialysis, fundus hemorrhages, and retinal detachment. Indications for treatment must be met as they arise. For instance, in glaucomatous increase of tension, eserin and paracentesis of the cornea; in retinal hemorrhages and detachment, rest of body and eye; for a lens in the anterior chamber, speedy extraction; in the vitreous chamber, expectant treatment. M. F. Weyman [2] gives sound directions that may be safely followed.

Laceration.—W. L. Pyle reports a case of extensive laceration of the external ocular muscles, diplopia, and spontaneous recovery in a physician, aged 44, in good general health. [The lesion was, of course, confined to the periphery and did not involve, like so many traumatic paralyses, the bones of the orbit or of the cranium.] In the patient of Swaysey [3] the frontal bone and left eye were wounded by the explosion of a gun. The eye was enucleated and it was found that the superior orbital plate was pushed down and nearly filled the orbit. The breech pin and screw were impacted in the wound in the frontal bone, and some soft brain matter and blood followed their withdrawal. In a few days headache, pain in the back of the neck, restlessness, convulsions, stupor, and twitching of the arm and leg supervened. The left arm became paralyzed and the patient died. The whole frontal lobe of the cerebrum was practically destroyed, the left lateral ventricle contained pus, and there was evidence of basilar meningitis. [Recovery from wounds of this character depends entirely upon the violence of the injury and the parts involved and not upon the intervention or skill of the surgeon.]

Foreign Body.—J. T. Carpenter's[4] case is instructive. During convalescence from an attack of mumps, a boy of 2 years developed purulent choroiditis, which was naturally diagnosed as metastatic. With later development of panophthalmitis the eye was enucleated and a chip of iron was discovered. Careful inquiry then elicited the fact that during convalescence the child had been playing most of the day in a blacksmith's shop, and no doubt an iron chip from the anvil had penetrated his eye, although neither he nor any of his family directed attention to it, nor did the state of the cornea, when the little patient was brought for treatment, arouse any such suspicion. Out of 160 perforating wounds of the eyeball analyzed by O. Shirmer [5] 69 were aseptic, and of this number 60 were saved with some vision. [This denotes very careful attention to the after-treatment.] Among the 91 in-

[1] Therap. Gaz., Dec., 1900.
[2] Ann. Ophth., Jan., 1901.
[3] Boston M. and S. Jour., Mar. 7, 1901.
[4] Phila. Med. Jour., May 11, 1901.
[5] Münch. med. Woch., Feb. 12, 1901.

fected wounds 46 eyes were lost, 36 obtained fair vision, and the remainder sightless, quiet globes. Shirmer attributes his good results to the use of mercury by inunction, 90 to 120 grains daily, atropia, and rest in bed.

Collapsed Balls.—[The use of sterile salt solution in collapsed eyeballs has become popular through the writings of Andrews, Knapp, and others.] E. G. Starr [1] reports 2 more successful operations.

OPERATIONS.

Instruments.—In the matter of caring for instruments W. B. Lancaster [2] finds that boiling in alkaline solutions does not rust instruments, if properly done. Soaking them in solutions of boric acid, salt, or even alcohol does harm and to him seems entirely unnecessary. Putting instruments away dry and clean is more important than the kind of case they are put in. A velvet case for the more delicate knives has fewer objections than a metal or a wooden one. Coating with oil which is very easily removed by boiling soda is a sure preventive of rust. Individual droppers should be supplied for every patient.

Physiology.—P. C. Jameson [3] observes that pus-producing organisms are found in the normal conjunctival secretion, although they are generally in attenuated form and do not propagate. Under normal conditions the eye is bountifully supplied with means of resisting bacterial growth, this resistance being much lowered after operations. The ocular secretions are not in themselves bactericidal. Strong antiseptics diminish the vital resistance of the secretion of the eye, so that thorough flushing with indifferent bland solutions becomes of much greater importance preliminary to operations.

Preparation for Operations.—E. Jackson [4] recommends repeated applications of strong solutions of silver nitrate, argentamin, or protargol at intervals for 1 or 2 days in cases in which there are marked evidences of existing infection, when such eyes are to be prepared for some important operation. In addition to these strong antiseptics he thoroughly cleanses the eyes with plain sterilized water, physiologic salt solution, or boric acid.

Turk [5] concludes, as the result of experiments with the large and **small electric magnets,** that the latter are preferable when they may be projected within a few millimeters of the splinter without injury to the vitreous. This includes foreign bodies in the anterior and posterior chambers, the iris, or the lens. For foreign bodies more deeply situated the large magnet is indicated. In the large magnet the current should be from 1 to 13 amperes, and in the small magnet from 3½ to 4½ amperes. Sudden shrinkage of the eyeball after use of the giant magnet is reported by J. Hirschberg and S. Ginsberg,[6] following pulling of a 22-milligram foreign body into the anterior chamber, whence it was ex-

[1] Arch. Ophth., July, 1901.
[2] Arch. Ophth., July, 1901.
[3] Ann. Ophth., Jan., 1901.
[4] Phila. Med. Jour., Oct. 28, 1900.
[5] Berlin. klin. Woch., Oct. 8, 1900.
[6] Centralbl. f. Augenh., Oct., 1900.

tracted. Hirschberg believes opening the wound of entrance and extraction with a small magnet would have given a better result.

Cranial Development.—As bearing upon the advisability of removing a sightless eyeball before cranial development has been more or less completed, W. E. Thompson [1] enucleated one eye in a series of rabbits about the twentieth day of life. At the end of 8 months the animals were killed and the orbits very carefully measured, the results showing a deficiency in the operated orbit of about 10%, uniformly distributed over the length, height, and depth of the orbit. This appears to argue against removal of an eye early in life if it is at all possible to save it, because of the resulting faulty development of the orbit. An experience of 14 cases leads H. Gifford [2] to prefer what he calls **simple evisceration** or evisceration without excision of the cornea. Although the stump gradually shrinks until the cornea is reduced to a mere facet, on the average a much larger stump is finally obtained than with excision of the cornea. Moreover, there is very little of the conjunctival edema that is often so annoying after the usual operation. Lagrange [3] describes 3 cases in which he successfully engrafted a rabbit's eye into Tenon's capsule. The resulting stumps were well formed and freely movable. The eyes should be small and taken from young rabbits. Obviously the most painstaking asepsis is necessary. J. G. Huizinga [4] proposes a substitute for enucleation and Mules' operation that may have advantages. The cornea is drawn upward and inward. A long incision is made through the sclera, commencing 6 millimeters posterior to its limbus and extending meridionally backward to the entrance of the optic nerve, through which the contents of the ball are thoroughly removed. A circular portion of the sclera, large enough to include the optic and ciliary nerves, is cut out and the nerves amputated. A fenestrated metal ball is placed in the scleral cavity and the opening in the sclera closed by sutures. Later the metal ball will be infiltrated by new tissue. The cornea is not cut away, but about 8 weeks later is tattooed to resemble as nearly as possible the fellow iris. He claims for it (1) slight local reaction, (2) no danger from sympathetic inflammation, (3) artificial eyes not necessary, (4) maximum result with minimum loss of tissue, (5) perfect movement.

THERAPY.

General Measures.—Among the remedies used to promote the absorption of exudates within the eyeball, R. Brunson [5] mentions, of course, mercury and the iodids, to which he adds sodium salicylate, in which latter drug he reposes much confidence [deservedly so]. His great fondness for hydrotherapeutic measures is, however, plainly evident. Especially does he commend them as valued adjuncts to the use of internal remedies. He describes fully the hot bath treatment as used

[1] Lancet, Nov. 17, 1900.
[2] Arch. Ophth., July, 1900.
[3] La Clin. Ophth., Mar. 25, 1901.
[4] Ann. Ophth., Apr., 1901.
[5] Jour. Am. Med. Assoc., May 11, 1901.

at Hot Springs, Arkansas. This, with pilocarpin under the skin, constitutes practically the whole number of general agents on which we can place reliance. H. F. Hansell [1] finds pilocarpin of great value in certain deep-seated ocular inflammations. His method is as follows: A convenient hour is chosen, usually 3 P. M., and the patient is put in a hot bath, during the progress of which he drinks a cup of hot tea. After 20 minutes' immersion the patient is put to bed and receives a hypodermic injection of $\frac{1}{12}$ to $\frac{1}{8}$ grain of pilocarpin muriate. The sweating is encouraged with hot-water bottles and blankets for 2 hours or more. Clean, dry bed clothing is then supplied and the patient, when gradually cooled off, is allowed to remain quietly in bed until the next morning, when he may get up and dress until the time for the next bath. If exhaustion follows the bath, a hypodermic injection of strychnin is made $\frac{1}{2}$ hour before the next bath. The diet should be largely fluid, and whatever local eye treatment is called for is, of course, not interfered with by the sweat treatment.

Subconjunctival Injections.—Subconjunctival injections are spoken of in the highest terms by Haitz.[2] He thinks they are specially indicated in vitreous opacities and central choroiditis, but he has found them also of service in postoperative infection and retinal detachment. For special mercurial action he prefers oxycyanate of mercury to the sublimate. Subconjunctival injections have also been found of the most astonishing service in detachment of the retina, according to Winselmann. (See section on retina.) According to Kraemer,[3] a 2% salt solution should be used for subconjunctival injections, to be made as far distant as possible from the cornea in the upper equatorial region. He has found them very useful in vitreous opacities, choroiditis resulting from high myopia, also in cases of beginning detachment of the retina.

Massage.—C. A. Wood [4] prefers simple massage with the tip of the finger to any form of instrumental massage. Indirect massage through the closed lids is better than direct massage of the surface of the cornea or conjunctiva. It is most satisfactorily employed in chronic diseases of the lid border, almost all the subacute and chronic forms of conjunctivitis, in most corneal ulcers and deposits in that membrane; also for the temporary relief of glaucoma and in some forms of retinal embolism. It is contraindicated in acute conjunctivitis and scleritis, in trachoma, and disease of the iris, ciliary body, lens, choroid, vitreous, and optic nerve.

Suprarenal Preparations.—D. R. Reynolds [5] bases his report on the therapeutic value of adrenalin chlorid upon 1222 experiments at his clinic at the Hospital College of Medicine. He has found that (1) it is a powerful hemostatic and acts promptly, generally within 1 minute from the time it is applied locally to mucous surfaces; (2) its effects persist from 20 minutes to 4 hours; (3) it promptly relieves ciliary pain in keratitis, iritis, and even the cyclitis of glaucoma; (4) it reduces ocular ten-

[1] Therap. Gaz., Aug. 15, 1901. [2] Klin. Monatsbl. f. Augenh., Aug., 1901.
[3] Southern California Pract., July, 1901.
[4] Jour. Am. Med. Assoc., Nov. 17, 1900.
[5] Jour. Am. Med. Assoc., July 6, 1901.

sion in glaucoma and apparently prevents hemorrhage in iridectomy; (5) it promptly clears up interstitial opacities of the cornea following contusions and seems to modify favorably the opacities of punctate keratitis in cases of syphilitic iritis; (6) it will in many cases so reduce the swelling in the tear-passages as to allow a stream of fluid to pass from Anel's syringe through the duct without the use of the probe. [Whether the suprarenal preparations do or do not have any therapeutic action is an important question yet to be decided. That they are of great diagnostic value in inflammations of the anterior ocular segment is admitted pretty generally, also the value of their hemostatic properties when properly used in operations on pterygia and the ocular muscles; but their direct therapeutic action remains to be proved.] H. B. Lemere [1] contends that the tendency of the suprarenal preparations is to blanch the conjunctiva at the risk of engorging the deeper anastomosing blood-supply of the iris and ciliary body. With the latter vessels in their normal condition and the iris or cornea unaffected this danger is practically *nil*. But with a tendency to iritis, and especially such tendency as accompanies keratitis and corneal ulcer, the danger is very real, as was shown by 3 cases in his own practice. Two cases of iritis were progressing favorably when acute exacerbations together with adhesions immediately followed the use of this drug. Zimmermann [2] (Stuttgart) notes the ability of suprarenal preparations to quiet certain intractable cases of glaucoma, particularly if used in connection with weak solutions of the miotics. Atrabilin, one of the recent adrenal preparations, is shown by Wolffberg [3] to act much the same as any of the other preparations drawn from this source.

Silver Salts.—Albargin, the latest synthetic organic silver salt, is said by Bornemann [4] to be more deadly to the gonococcus than all other remedies. It is a white powder, usually employed in 2% aqueous solution. Ichthargin, possessing ichthyol and silver in combination, is said by M. Falta [5] to be stronger in silver than other organic preparations and much more penetrating. However, the results he shows from its use in 8 cases of trachoma do not speak very highly for it. F. Daxenberger [6] is fond of argentamin in all kinds of conjunctivitis with considerable swelling and secretion. He brushes a 5% to 10% solution over the everted lids. Three per cent. solutions are used in the after-treatment. Bergel [7] claims that the instillation of a 1% to 2% solution of argentamin in suppurative conjunctival diseases is very useful. It is also indicated in trachoma, acute follicular catarrh, chronic suppurative trachoma, and blennorrhea neonatorum. Among the silver preparations G. Hartridge [8] has tried to estimate the comparative value of the following: actol (lactate of silver), itrol (citrate of silver), argonin (casein with 4% of silver), argentamin (2.6% of silver), nargol (nucleinate of silver),

[1] Am. Med., Oct. 5, 1901. [2] La Clin. Ophth., Oct. 10, 1900.
[3] Woch. f. Ther. u. Hyg. des Aug., Dec. 13, 1900.
[4] Woch. f. Ther. u. Hyg. des Aug., No. 30, 1901.
[5] Arch. f. Augenh., Bd. XLIII, No. 2.
[6] Woch. f. Ther. u. Hyg. des Aug., Bd. IV, No. 1.
[7] New Eng. Med. Monthly, Apr., 1901. [8] Brit. Med. Jour., Nov. 2, 1901.

largin (silver 11.8 % with protalbin), and protargol (silver 8.3 % and a vegetable albumin). He prefers the latter in 20 % to 30 % solutions used freely. A. Darier [1] also prefers protargol to all other silver salts, as it is the most reliable and at the same time innocuous. J. Piotrowski [2] speaks for protargol in 10 % solution especially as a preventive of purulent conjunctivitis of the newborn. In 1030 cases there was not one infection. [While there is much difference of opinion among high authorities as to the value of protargol, most observers believe it to be much less painful than silver nitrate. Of the practical value of the drug there is no question; but problems of idiosyncrasy, dosage, etc., must be solved before it can be given a definite place in ophthalmic practice. At present it can be said to be held in highest esteem in France, next in Italy, and third in the United States.]

Miscellaneous.—The value of **dionin,** says L. Vermes,[3] is not to be questioned in diseases of the cornea not caused by a conjunctival affection; also in disease of the iris and ciliary body, in which trouble it should be combined with mydriatics. Cipriani [4] has been using **enophthalmin hydrochlorate,** a new mydriatic that stands chemically very close to eucain B. In iritis that does not respond readily to atropin he found no difficulty in relieving pain and breaking down synechia, with 2 % to 5 % solutions of this new drug. J. H. Claiborne [5] recommends **copper sulphate** in maculas and superficial inflammations of the cornea not due to trachoma, especially when accompanied by a succulent velvety conjunctivitis of the upper lid; also in chronic conjunctivitis and blepharitis and in chronic dacryocystitis; keratitis is thus cured without atropin. In corneal ulcer with hypopion R. Williams [6] uses a solution of 4 grains each of quinin and atropin sulphate, which he has found of great value.

NEW INSTRUMENTS.

C. A. Oliver [7] has simplified his **stereoscope** presented 3 years ago. He uses it daily for the study of extraocular balance, the exercise of imperfectly working muscles, the proving of binocular vision, etc., and finds it of great service.

W. M. Sweet [8] offers a new electric self-registering **perimeter** (Fig. 106) that is very ingenious in construction. It has the advantage of being noiseless, and its facility for accurately measuring the limits of the field by eliminating the possibility of deception and imperfect observation on the part of the patient adds to its value. A small electric light is used as a test object.

W. E. Baxter's [9] idea of a **lid retractor** made of wire is an excellent one, as it furnishes a perfectly aseptic, cheap instrument. It is made of

[1] *Ibid.*
[2] Centralbl. f. Gynäk., Aug. 3, 1901.
[3] Woch. f. Ther. u. Hyg. des Aug., Feb. 7, 1901.
[4] Wien. med. Woch., No. 46, 1901.
[5] N. Y. Med. Rec., July 27, 1901.
[6] Brit. Med. Jour., Oct. 26, 1901.
[7] Ophth. Rec., Aug., 1901.
[8] Jour. Am. Med. Assoc., Nov. 17, 1900.
[9] Ophth. Rec., Aug., 1901.

nickeled wire, with a large retractor on one end and a smaller one on the other [a modification of an old and favorably known instrument].

E. L. Oatman [1] has overcome the objections to the ordinary combined **lid elevator and irrigator** by placing a wire guard in front of the outlet, which, by holding the conjunctiva away, preserves a free space for the escape of fluid into the conjunctival culdesac under a gentle pressure of the bulb. (See Figs. 107 and 108.)

C. F. Clark's [2] **double hook for advancement operations** is intended to simplify the operation, and to make it possible to regulate with more or less certainty the amount of shortening obtained. (See Fig. 109.)

Having used all the different trachoma **forceps** and finding that all engage the conjunctiva to an undesirable and injurious extent, J. C. Han-

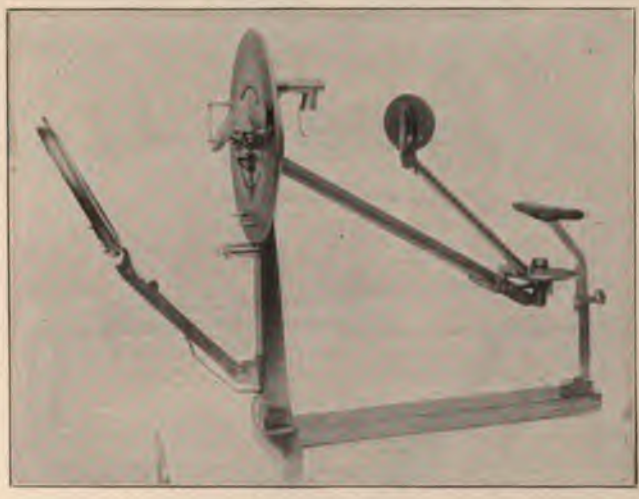


Fig. 106.—Sweet's electric self-registering perimeter.

cock [3] has devised one with smooth cylinders that he claims is entirely satisfactory. For this same purpose P. C. Jameson [4] uses two dull-toothed blades mounted on separate handles.

In electrolyzing recently paretic or paralytic muscles H. S. Scheiber [5] employs various shaped **electrodes** according to the area requiring treatment.

H. Wolff [6] claims that with his new **electric ophthalmoscope** physiologic opacity of the retina may be seen, pulsation is frequently visible in the arteries and veins, and the direct transmission of the arterial pulse to the veins can be followed. He considers arterial pulsation as entirely normal. Furthermore, the macular red spot was observed

[1] N. Y. Med. Jour., July 21, 1900.
[2] Jour. Am. Med. Assoc., Nov. 17, 1900.
[3] N. Y. Med. Rec., Jan. 26, 1901.
[4] Ophth. Rec., Feb., 1901.
[5] Wien. med. Woch., No. 52, 1900.
[6] Ann. Ophth., Oct., 1901.

in every eye examined, whether in children or adults. Minute early changes in the macular region, leading to early diagnosis of central retinitis (not observable with the ordinary instrument), are easily made out.

The stationary ophthalmoscope devised by W. Thorner, of Berlin [exhibited before the Section on Ophthalmology, College of Physicians, Philadelphia, October, 1901], marks a great advance in the study of diseases of the eye-ground. H. F. Hansell considers it indispensable for

Fig. 107.—Oatman's improved lid elevator.

Fig. 108.—Oatman's irrigator.

Fig. 109.—Clark's double hook, for use in advancement operations; *b* is a strip of tape drawn up into a fold by the hook at *c d*, showing the points for the insertion of sutures at X X X.

every one interested in the practice of ophthalmoscopy. The fundus is instantaneously seen, by experienced and inexperienced observers with equal facility. The field is greater than that of the inverted image and has the magnification of the direct. The illumination is all that can be desired, and there is an entire absence of reflexes. The fovea is visible in every patient, arterial pulsation is frequently noticed, and a dark pigment area surrounds the papilla. These and other details hitherto undescribed as a part of the normal fundus picture, possible of study only by the Thorner ophthalmoscope, place that instrument in the first rank among ophthalmoscopes.

OTOLOGY.

By CHARLES H. BURNETT, M.D.,
OF PHILADELPHIA.

William H. Thomson,[1] in an article entitled "The Importance of a Knowledge of Ear-disease to the General Practitioner," made the following very eloquent statement: "Twenty-five years ago I would scarcely have said what I now most decidedly affirm, that the general practitioner should feel a greater sense of responsibility when called to treat a case of ear-disease than he need feel about affections of all the other organs of special sense put together."

Cholesteatoma of the External Ear.—Regarding the etiology of cholesteatoma in the external auditory canal, J. Habermann [2] concludes that "a long-continued discharge of pus into the external auditory canal and retention of this secretion in this passageway lead to a chronic inflammation in the epidermis and excessive formation and exfoliation of the horny layers." "Another reason for the development of cholesteatoma in the ear is the chronic inflammations of the bone of the external auditory canal and in the middle ear, conditions which induce a copious supply of blood in the ear and a consequently better nutrition of the Malpighian layer, and increase in the number of its cells." Incidentally Habermann has observed in these investigations that a slight degree of hyperostosis of the promontory and of the inner tympanic wall, leading to a positive closure of the niche of the round window, is induced by chronic inflammation of the middle ear.

Conical Perforations of the Membrana Tympani in Acute Purulent Otitis Media.—L. Katz [3] demonstrates that the conical protuberance on the membrana tympani, marking the position of the perforation in some cases of acute otitis media, consists of densely infiltrated granulation tissue, covered with highly inflamed epidermis, and emanates from the mucosa of the tympanic surface of the membrana tympani. Through the long axis of such a cone runs a narrow canal lined with a layer of epithelium similar to that covering the outer surface of the cone, showing that the epidermis of the membrane is invaginated into the perforation. The causes of such a conical formation are: (1) A narrow high-placed perforation; (2) rather thick purulent or mucopurulent exudation; (3) a thick, relatively resistant, inflamed cutis layer in the drum membrane; (4) an inversion of the epithelial edges into the

[1] Sec. of Otol., N. Y. Acad. of Med., Dec. 12, 1900; Arch. of Otol., Feb., 1901.
[2] Arch. f. Ohrenh., Dec. 3, 1900.
[3] Arch. f. Ohrenh., Dec. 3, 1900.

narrow perforation, whereby the latter is still further narrowed. The difficult escape of thick pus from the drum-cavity causes sufficient irritation in the mucous surface of the membrana tympani to induce circumscribed granulation formation, with resultant destruction of the membrana propria at this point. The discharge, however, still finds hindrance to its escape, from the yet resistant epidermis layer of the membrana, causing it to push the latter ahead of it in a hernia-like protrusion. Such a condition tends to close further the narrow exit canal in the cone, and hinder the discharge of pus from the drum-cavity. The formation of such a cone on the membrana tympani in the course of an acute purulent inflammation of the middle ear threatens a retention of pus within the drum-cavity, and must receive immediate attention. As soon as observed it should be cut open and dilated, as shown by Schwartze, since this tends in most cases to free outlet and prompt recovery. In cases in which the method does not give relief to ear pain, fever, etc., if the cone is prominent enough it must be seized with a polypus snare, or other suitable instrument, and removed as close to the membrana as possible.

The Organ of Hearing in Purpura Hæmorrhagica.—M. Sugár,[1] in an article on this subject, rejects the old theory that purpuric affections are due to a dissolution of the blood, and adopts the modern view that purpura rheumatica and purpura hæmorrhagica are of bacillary origin. (Kolb, Letzerich, Jarisch, *et al.*) He then describes a peculiar ear-disease observed by him in a case of peliosis or purpura hæmorrhagica, in a man of 28. In this man there was observed at the time of his admission to the hospital, in addition to numerous purpuric spots on the extensor surface of his lower extremities, a distinct herpetic eruption on the left auricle, the hearing and the membranes on both sides being normal. Two days later there suddenly occurred intense and uncontrollable vomiting, lasting 13 hours. There was no blood in the vomit. Simultaneously there occurred in the right ear intense tinnitus, accompanied by great vertigo, and deafness. Bone conduction was entirely abrogated on the right side of the skull. The next day the right auricle was the seat of 23 purpuric eruptions, the face remaining entirely free. Hemorrhagic spots were seen in the external auditory canal and two upon the membrana tympani near its periphery. After the appearance of this purpuric eruption on the auricle the vomiting, vertigo, the tinnitus and earache ceased, and the bone condition was reinstated. Three days after this recovery the patient left the hospital, but returned the next day with a relapse in all the symptoms, both general and special. In 24 hours the subjective symptoms in the ear and head disappeared once more, the patient, however, remaining very anemic. Sugár is disposed to attribute all the ear symptoms to hemorrhage into the labyrinth. [It seems to us, however, that a hemorrhage into the labyrinth extensive enough to produce the above-named aural symptoms could not have been absorbed so quickly as this appeared to be, if in fact it could ever have been absorbed to a degree sufficient to

[1] Arch. f. Ohrenh., Sept. 20, 1900.

permit a restoration of hearing.] The treatment recommended in such cases as these consists in iron, quinin, and arsenical preparations.

Acute Otitis Media in a Case of Purpura Hæmorrhagica.—S. Tomka [1] reports the occurrence of acute otitis media in a woman of 29, the subject of purpura hæmorrhagica (Morbus maculosus werlhofii) after malaria. In the right ear extravasation of blood occurred in the membrana tympani, on the walls of the auditory canal, and also between the lamellas of the membrana tympani. In the left ear the extravasation passed into a suppuration, resulting in the perforation of the membrane. Recovery ensued in the ears upon disappearance of the general disease.

Pathologic Changes in the Middle Ear after Acute Otitis Media.—Panzer [2] has observed the following changes in the middle-ear cavities after acute otitis media: In the mastoid antrum the mucous membrane is richly supplied with round, nonhypertrophied cells. In the deepest layers there is found a plexus of blood-vessels and lymphatics, enlarged and ramified. In places there are granulations penetrating freely into the antrum. The antrum itself is partly free and in other places filled with exudations. The epithelium of the surface is in places well preserved, while in others it has disappeared. In the drum-cavity proper, the atrium, a large quantity of exudates is found, on which account the tympanic membrane is pushed forward. In the membrana tympani there are found blood-vessels and dilated lymphatics. The epithelium on the inner surface of the membrana is well preserved only on the inferior portion, while near the center it is to a large extent destroyed. The external epidermis is elevated and lies in folds on the surface of the membrane. In some places the substance of the membrane is also hypertrophied by infiltration of round cells, but the infiltration never penetrates into the mucous membrane and the substantia propria always remains intact. The perforation is near the short process, where the membrane is swollen by an accumulation of exudate which enters through the perforation. Pussak's space is filled with exudates, and at that spot the membrana tympani presents a convexity outward. In the cavity of the atrium exudates are found everywhere, but they are most numerous in the posterosuperior region; and next in quantity in the lower part and in the region of the oval window. The exudate consists in a hypertrophy of leukocytes, with one or two nuclei. The mucous membrane of the atrium is pathologically modified throughout its entire tract. The thickening of the mucous membrane is produced by round cells, which are found in great numbers on the surface and in the interior. External to the cells of the tissues, the blood-vessels and the lymphatics form nodes and narrow plexuses. The surface is only partly covered with epithelium, the greater part being deprived of it. Throughout the mucous membrane there are found elevations more or less marked. On the median walls these

[1] Arch. f. Ohrenh., Dec. 3, 1900.

[2] Thirteenth Internat. Cong. of Med., Paris, Aug., 1900; Ann. des Mal. de l'Oreille, Oct., 1900.

elevations are thick in the inferior part, and particularly in the anterior part of the tympanum they have the appearance of glove fingers. In the attic also there are found granulations filling the spaces between the ossicles and the outer walls of the attic and the ossicles, but here the granulations are united to the surface and cover the walls with a thick velvety layer. The rest of the space is filled with exudates. The mucous membrane covering the ossicles undergoes the same modifications as the other portions of the mucosa. The osseous substance remains intact, excepting on the surface of the incus, where a slight pathologic change is observed. Here there is a superficial loss of bony substance caused by an enlargement of the large cells. It may be that there occurs a lacuna of Howship with an accumulation of osteoclasts, but this change is observed only over a very limited tract. On the stapes the granulations may be so large as to extend beyond the circumference of the bone. Between the crura of the stapes free exudation is found. The other modifications in the tympanic cavity participate in the inflammation by forming with their mucous coverings the base of granulations. This is specially seen on the tendon of the tensor tympani. On this granulations may be seen to extend all the way from where the tendon comes into the drum-cavity to its insertion into the malleus. The chorda tympani presents the same phenomena. In regard to the facial nerve, the Fallopian canal is sometimes found open, and at places it can be seen that the exudation penetrates even into the fibrous tissue. This fact has a very practical importance because it shows how readily the facial nerve may be implicated in the course of tympanic inflammations, especially in children.

Tympanic Pneumomassage.—Suarez de Mendoza [1] has found the application of pneumomassage to the ear, for from 15 to 20 minutes at a sitting, has the best effect upon tinnitus aurium. Good effects of pneumomassage by Siegle's pneumatic otoscope, and also by the masseurs of Delstanche and Collins, are also demonstrated by Cuvillier and Vassal.[2]

Surgical Treatment of Chronic Catarrhal Otitis Media.—Miot [3] has observed that an operation on the more affected ear not only benefits the hearing in it, but has a similar effect in the opposite ear, not operated upon. [This was also observed by the late Dr. Sexton, of New York, and has been observed and reported by C. H. Burnett.] F. Siebenmann [4] endeavors to show that the term sclerosis of the ear should be abandoned and that of progressive spongiosity of the labyrinth capsule substituted for it, with subdivisions of ankylosis of the stirrup, nervous deafness, and a combination of these two, "dysacousis of Bezold." He disapproves of all surgical interference in this form of aural disease, and substitutes a phosphorous therapeusis, phosphorous emulsion of Kassowitz (0.01 %), in doses of two tablespoonfuls a day. It is asserted that such treatment relieves the tinnitus and deafness. It, however, must be persevered in for years in order to obtain good results.

[1] Ann. des Mal. de l'Oreille, Oct., 1900. [2] *Ibid.*
[3] Ann. des Mal. de l'Oreille, Oct., 1900. [4] Ann. des Mal. de l'Oreille, Nov., 1900.

Treatment of Chronic Purulent Otitis Media. — E. Leutert,[1] in writing on this subject, states that the term "suppuration of the middle ear" is not a specific, but a general one, and the same may be said of the treatment of chronic suppuration of the middle ear. In his article he endeavors to show how the surgeon may determine (1) the seat of the suppuration in the ear, and (2) whether or not there is any disease of the bone in the middle ear, as the treatment would be modified thereby. The first head is divided into four subdivisions: (*a*) Suppuration of the middle ear; (*b*) tubal and nasopharyngeal suppuration; (*c*) suppuration of the attic; and (*d*) suppuration of the antrum. These four he regards as forms of "simple chronic suppuration of the middle ear." Under the second head he places (*e*) suppuration with disease of the auditory ossicles, and (*f*) suppuration with disease of the bony walls of the drum-cavity, which forms he classes as "complicated chronic suppuration of the middle ear." Other complications, like facial paralysis, polypi, brain abscess, pyemia, etc., he leaves out of consideration in this

Fig. 110.—1–5, Simple suppurations of the drum-cavity and the eustachian tube; 6–8, caries of the incus; 7, caries of the head of the malleus; 9, attic suppuration with possible caries of both malleus and incus; 10–11, caries of the head of the malleus; 12, caries of the incus and suppuration of the antrum, and possibly associated cholesteatoma.

article. *Diagnosis:* According to Leutert these various forms can be diagnosed by the position of the perforation in the membrana tympani. (Fig. 110.) The seat of the perforations may be (*a*) in the lower half of the membrana, either in front or behind the umbo, or the opening may comprise the entire lower half of the membrane in the form of a kidney-shaped perforation. (*b*) The perforation may be in the anterior half of the membrana tympani; either in the lower part of this region or opposite the tympanic mouth of the eustachian tube. (*c*) It may be in the membrana flaccida (Shrapnell's), either in front of or behind the short process, but not reaching to the periphery. (*d*) Or it may be in the flaccid membrane either in front of or behind the short process of the malleus, reaching to the periphery. Complications may exist among these four forms so as to cause the existence of two simultaneous perforations. In the diagnosis of caries of the ossicles the following are given as guiding points. If the perforation lies in the posterior upper quadrant, it indicates isolated caries of the long limb of the incus. If the perforation in the flaccid membrane reaches the periphery, it indicates

[1] Münch. med. Woch., 47. Jahrg., No. 39, 40, 41; Arch. f. Ohrenh., Apr. 15, 1901.

the presence of caries of the tegmen antri, the posterior wall of the antrum, and the innermost part of the posterior wall of the auditory canal. Like suppuration *d*, so is the condition *c*, often complicated with *e*. If the perforation in the flaccid membrane lies directly above the short process, it indicates caries of the head of the hammer; if it lies behind the short process, caries of the incus exists (Schwartze). If the perforation lies not entirely in the membrana, but extends into the osseous wall of the attic, it is an indication also that caries of the head of the hammer is present. If this form of perforation in the bone extends backward, it indicates that both hammer and incus are carious with implication of the antrum in the caries; *e. g.*, the form *d*. If the entire membrana is destroyed and the ossicles wanting, the seat of the suppuration can be diagnosed by direct inspection, or by aspiration by means of Siegle's pneumatic otoscope. If there is a peripheral remnant of the membrana tympani, with the handle of the hammer projecting free into the drum-cavity, it may be concluded that there is no caries of the incus, there being no retention of pus to induce caries of this bonelet. As an example of this form of disease scarlatinous suppuration is adduced. Siegle's pneumatic otoscope will aid in diagnosis also in this condition. Finally, suppuration of form *f* may be diagnosed as follows: A perforation in the lower posterior quadrant indicates caries of the posterior or lower wall of the drum-cavity. If the perforation lie in the lower anterior quadrant, caries exists in the lower anterior wall of the drum-cavity. If the perforation reach to the anterior periphery, about in the middle of the membrana, it is a sign of great suppuration in the eustachian tube, and if the perforation be peripheral and reach to the anterior wall of the attic, caries exists in the anterior part of the attic, without participation of the ossicles in the process. Caries of the labyrinth wall may be observed directly through the perforations. According to these data Leutert concludes that in perforations in the lower segments of the membrana, not extending to the periphery, the diagnostician can exclude extensive disease in the adjacent cavities of the tympanum. This is important in the therapeusis, that becomes conservative in such instances. These nonperipheral perforations of the lower segments of the membrana tympani are characteristic, therefore, of isolated suppuration in the drum-cavity; *i. e.*, we can diagnose the seat of the middle-ear suppuration, caries of the auditory ossicles, and of the walls of adjacent cavities of the ear, with almost positive certainty by means of the appearance of the perforated membrana tympani. The presence of cholesteatoma does not influence the treatment, as it is nearly always an accompaniment of suppuration and caries of adjacent cavities, and demands no special treatment. *Treatment:* Leutert teaches that in suppurative otitis media and in suppuration of the eustachian tube and nasopharynx, when there is no perforation reaching to the periphery in the lower half of the membrana tympani, no operation on the ossicles is indicated, as it will not reach the focus of the disease. Of course, all underlying causes of the ear-disease, such as ozena, adenoid vegetations, etc., must be removed. An endeavor must also be made to offer the best possible escape for the pus

from the drum-cavity. As the lowest lying perforation in the membrana lies higher than the floor of the tympanum, the pus must be removed from this region by the surgeon. This is best accomplished, in Leutert's opinion, by cleansing the drum-cavity through the eustachian tube by means of the catheter. The ear-syringe is employed only for cleansing the auditory canal in order to obtain a view of the drum-membrane, as when syringing is gentler than mopping, or the canal is narrow, or the discharge tough. When the catheter is employed, inflation of air is sufficient for cleansing if the quantity of secretion is slight; when the secretion is copious, injections of a physiologic salt solution, followed by the air douche, are demanded. This method, according to Leutert, has the advantage of being able to prevent adhesions of the eustachian tube, and favoring the exit of pus by way of the auditory canal, instead of into the eustachian tube and possibly into the opposite ear, as may occur in syringing the ear through the external auditory canal. He considers the insertion of antiseptic gauze into the auditory canal as of very little value, and insufflation of powders is said to be admissible only in the case of large perforations; in other instances these may be harmful. The same is said to be true of antiseptic drops, though these may be applied in cases with moderate perforations after the tympanic mucous membrane has been cleansed with the stream of fluid through the catheter. Catheterization in cases with large defects in the membrana tympani is considered worthless, as according to Leutert in such cases the air passes directly from the mouth of the eustachian tube into the auditory canal without cleansing the drum-cavity. The latter must be cleansed before medicaments are applied to it from the auditory canal. He is of the opinion that only in cases with peripheral perforations in the lower half of the drum-membrane—*i. e.*, in disease of the posteroinferior or anteroinferior wall of the drum-cavity—an operation on the membrana exposes the focus of disease to direct treatment, for the posterior wall of the auditory canal cannot be well removed on account of the presence of the facial nerve, and the floor of the drum-cavity is only very rarely attainable by the chisel. In such cases he recommends conservative treatment, even if at the same time the prognosis is unfavorable. He believes that spontaneous healing is possible. A perforation in the posterosuperior quadrant—*i. e.*, caries of the long limb of the incus—demands an immediate extraction of the hammer and incus through the external auditory canal. When the perforation in the flaccid membrana is close above or behind the short process,—*i. e.*, when caries of the head of the hammer or of the incus is present,—this operation is less certain of benefit on account of the simultaneous suppuration in the attic; yet it should be tried, since it offers fair chances in nonperipheral perforations. In any event the radical mastoid operation may be delayed in such cases. When the defect in the membrana tympani is extensive, with but a very narrow rim remaining, before a malleoincudal extraction is performed the source of the pus must be ascertained by means of Siegle's pneumatic otoscope. Leutert then proceeds to show that a peripheral perforation in the membrana flaccida (Shrapnell's)

or such a one in the posterosuperior quadrant—*i. e.*, behind the short process of the malleus, being indicative of suppuration in the antrum regardless of the complication with disease of the ossicles and suppuration in the attic—demands free radical exposure of the middle-ear cavities by Stacke's method whether or not there be mastoid symptoms, because such a disease threatens life by reason of possible retention of pus and the formation of cholesteatoma; though sometimes cure can be effected without such radical measures. Very often the operation discloses extensive disease of the bone. Leutert prefers, even when cholesteatoma exists, immediate closure of the retroauricular wound to a permanent opening at this point, because he believes that a skilful operator will rarely fail to detect and remove all diseased bone, nor permit traces of cholesteatoma to remain. If these do happen, however, it is shown by the formation of a fistula. *Prognosis:* All cases of purulent otitis media in which operative interference is indicated as shown above are life-threatening. Only a small percentage remain uncured, though these are greatly benefited. According to the interpretation of the symptoms as above given from Leutert's work it is possible to differentiate the dangerous from the innocent forms of chronic middle-ear suppuration. True cholesteatoma is a very rare occurrence, but cholesteatoma as often found and reported is, according to Leutert, the consequence of neglected suppuration of the middle ear, arising from the utter ignorance of the nature and treatment of ear diseases.

Nosophen in Ear Diseases.—Bürkner [1] reports that "nosophen (tetraiodphenolphthalein) appears to him to be of limited usefulness in the treatment of ear diseases. It comes into place just where iodoform would, viz., in the treatment of external wounds, and is therefore applicable only to inflammatory processes and granulations in the external auditory canal." Numerous trials of this drug in a very large clinic have ended in this conclusion. Bürkner says the same thing concerning edoxin, protargol, and amyloform. On the other hand, "naftalan salve" (96% crude naphtha and 4% anhydrous soap) has been of value in his clinic in the cure of acute and chronic eczema of the ear and nose.

Results of Chronic Purulent Otitis Media.—Kretschmann [2] reports a case in which a neglected chronic purulent otitis media induced an infection of the skin of the anterior wall of the auditory canal. This inflammatory process attacked the cartilage of the auditory canal and the soft parts about the maxillary articulation, and the joint itself at last. In a few days all the tissues thus attacked broke down and led to a most serious hemorrhage from an arterial branch. The mortification advanced and led to an irruption into the pharynx, paralysis of the facial nerve, and at last necrosis of a large portion of the right inferior maxilla. With the removal of this sequestrum healing took place, and the chronic purulency of the ear was checked by the so-called radical exposure of the middle-ear cavities. Had this latter been done a year previously the serious life-threatening lesions in the maxillary and pharyngeal regions would have been prevented.

[1] Arch. f. Ohrenh., Aug., 1900. [2] Arch. f. Ohrenh., Sept., 1900.

Surgical Treatment of Chronic Purulent Otitis Media.—T. Heiman [1] begins the treatment of all uncomplicated chronic purulent otitis media with local medications. These are abandoned when it is evident they produce little or no effect and operative interference applied. The first step is the removal of the carious ossicles,—malleus and incus,—and this is often followed by a radical cure, even when the walls of the tympanic cavity are affected to some extent, for the latter can be reached by local treatment after the removal of diseased and obstructing ossicles. Grunert and Zeroni [2] have observed that excision of the carious malleus and incus, through the external auditory canal, is generally followed by cessation of purulency, though the latter may be delayed many months. They therefore wait much longer than formerly before resorting to the radical operation as a supplement to excision of the ossicles for cure of chronic otitis media. [We have long contended for this conservative procedure.] Instead of detaching the auricle and then operating upon the attic and aditus, as in the radical Stacke operation, Vacher [3] detaches and draws out the upper half of the cutaneous auditory canal. Two incisions, nearly horizontal, are made, one on the anterior, the other on the posterior wall of the auditory canal, from the membrana tympani to the concha. The upper flap thus made in the canal is detached, drawn outward, and turned upward on the surface of the concha, and held away from the meatus by a speculum. Hemorrhage is quelled by a firm tampon for a few minutes. After skin and periosteum are removed it is claimed that more than half of the bony entrance to the drum-cavity is exposed to full view. This opening is sufficient for the removal of the ossicles, curetment of the attic, and even the removal of the superior posterior wall of the auditory canal with a gouge, and exploration and curetment of the aditus. After the operation is ended the upper cutaneous wall of the canal is replaced and kept in place by a firm tampon of iodoform gauze. In order to avoid the occurrence of atresia of the canal the dressings must be carefully watched. It is seen that in this method a Stacke operation is performed without detachment of the auricle.

Mastoid Disease.—Subperiosteal abscess of the mastoid may be unaccompanied by intramastoiditis, according to Luc.[4] After evacuation of the pus from beneath the mastoid soft tissues the surgeon may safely wait to see what takes place. If the discharge from the ear clear and the mastoid swelling go down, it may be concluded that tympanic and antral suppuration has ceased, and that the patient will recover. If the mastoid cells in such a case are opened at the time of evacuation of the subperiosteal abscess, the risk of infection of the mastoid cells from the latter is very great.

Evolution of Mastoiditis Not Operated Upon.—J. Molinié,[5] from personal observation of 73 cases of mastoiditis not operated upon, draws

[1] Ann. des Mal. de l'Oreille, Nov., 1900. [2] Arch. f. Ohrenh., June 28, 1900.
[3] Ann. des Mal. de l'Oreille, Oct., 1900.
[4] Ann. des Mal. de l'Oreille, Oct., 1900.
[5] Thirteenth Internat. Med. Cong., Paris, Aug., 1900; Ann. des Mal. de l'Oreille, Oct., 1900.

the following conclusions: (1) Acute mastoiditis is susceptible of cure either by spontaneous resolution of the inflammatory phenomena or under the influence of medicinal treatment. He observed 14 cases of this form. (2) Mastoiditis may recover by spontaneous trepanation, a rare occurrence (1 case), fistulization of the mastoid after spontaneous opening being the rule. (3) The mastoiditis that has opened on its medial plate, and the pus from which has poured itself into the sheath of the vessels (Bezold's), may recover by spontaneous opening of the cervical abscess (1 case). (4) Fistulous mastoiditis may recover at length by cutanization of the fistulous tract (1 case) or by cicatrization and closure of this tract (1 case). The 55 cases not resulting in recovery are divided as follows: In seven cases not operated upon, or else insufficiently operated upon (by Wilde's incision and operation on the drum-cavity), there was death with meningitis or pyohemic symptoms. Five cases resulted in cholesteatoma. Eleven cases were left with chronic mastoid fistulas. Finally, 32 cases of acute mastoiditis passed into the chronic form. These cases gave rise to two clinical forms, as follows: (1) Chronic fungous antritis; (2) latent diffuse mastoiditis. In the latter class were many that were pronounced well by incompetent observers. These show how precarious is the prognosis of mastoiditis when either left to itself or treated medicinally.

Mastoiditis with Perforation of the Medial Plate of the Process (Bezold's).—S. J. Moure [1] thinks that the name Bezold's mastoiditis is misleading, since the condition of the mastoid process specially described by this author—perforation of the point of the mastoid with burrowing of pus into the soft tissues of the neck—does not always exist alone. Moure states that whenever he has found the point of the mastoid perforated or about to perforate, he has also discovered at the same time necrosis of the bone in other parts of the mastoid cavity. He cites 16 cases of mastoiditis of the point of the process, gathered from among 76 cases of mastoiditis operated upon by him. After careful examination of the notes of these 16 cases of perforative mastoiditis at the point of the process it became apparent that such lesions may be accompanied sometimes by a perforation of the internal table, situated usually at the level of the sinus, though sometimes the perforation may be near the upper part of the antrum or toward the osseous auditory canal; very rarely does the perforation open outwardly (mastoid fistula). Whenever he has found a Bezold's mastoiditis—*i. e.*, when there existed a purulent collection in the neck—the exposed part of the meninges was always bathed with pus and covered with fungous granulations. This author concludes that while it is well to search for the complications in the neck and treat them, the surgeon must not neglect the changes which may be present in the mastoid cavity toward the meninges, as they are quite as important as the lesions in the digastric groove. He further advises that after these parts are thoroughly cureted, the wound well mopped with chlorid of zinc, and cleaned by means of a cyanid solution, the wound should be almost completely closed, leaving

[1] Thirteenth Internat. Med. Cong., Paris, Aug., 1900.

only a simple drain of moderate size in the tract. This proceeding abridges markedly the treatment, as under these circumstances entire recovery usually takes place in a few weeks. He regards it as useless to denominate such processes by the name of a man, in which opinion your reporter agrees.

Osseous Lesions of Acute Mastoiditis in the Adult.—E. Lombard [1] has always found in his operations on the mastoid of the adult the antrum (in reality a portion of the tympanum) more or less affected, often filled with pus and granulations, but sometimes lined with thickened mucous membrane and containing very little purulent liquid in its cavity. In some instances the antrum has been found surrounded by an osseous zone of healthy appearance. This "zone of encystment" is not uncommon in chronic otorrheas. It is rarely found in acute affections. Lesions of the mastoid cells proper are varied in their grouping and distribution. He describes two forms of inflammation of the mastoid cells, viz.: the form *without* circumscribed abscesses and the form *with* either collective or isolated abscesses. The form *without* collective or isolated abscesses is further subdivided into two varieties, viz.: *diffuse* inflammation of the cells, uncommon in occurrence, in which all the cells are included, and a variety characterized by a purulent breakdown of all the bony trabeculas and cell-walls within the mastoid cavity. The *second* or *circumscribed* form, that characterized by localized and limited abscesses, is more frequently observed. In it are found abscesses of the anterior group of mastoid cells, those immediately below the antrum. These abscesses may exist in conjunction with lesions of the cells in the point of the mastoid process. In front they are limited by the facial canal, which they not uncommonly erode. Lombard has found this form the commonest one. Next to these abscesses of the anterior group of mastoid cells come the abscesses of the point of the mastoid process. The nearly constant presence in the adult of one or more cells at this point of the mastoid explains their presence here. These abscesses are not purely isolated, as they often coexist with abscesses of the anterior (subantral) cells, and when the two pus collections are evacuated, a large vertical cavity is left, uniting the antrum with the lowest part of the mastoid process. A third variety of circumscribed mastoiditis is that limited to the posterior mastoid cells, along the entire vertical extent of the posterior border of the mastoid cavity. Here large purulent cavities are rarely found; the abscesses here are small, multiple, and often without communication with one another. They may extend upward near the posterior boundary of the antrum and backward into the occipital bone. A fourth variety, though uncommon, still very important, is that formed by abscesses of the superior group of mastoid cells. These are connected with the squama. Here the lesions are above the antrum and extend forward beneath the root of the zygomatic arch. These are called by Mignon anterosuperior abscesses. All these forms may coexist and be combined. Lombard concludes that it is a safe rule "always to ascertain the condition of the entire cellular system in

[1] Ann. des Mal. de l'Oreille, Dec., 1900.

the course of operation upon any mastoid case no matter how simple in appearance." Clinical symptoms are often sufficient to establish a very probable anatomic diagnosis. The locality of the pain on pressure and localized edema should be considered of importance. However, numerous errors occur, for sometimes the pain is diffuse and renders no indication of value. Again, it may be at its maximum at the level of the antrum, when important lesions are found to exist at the mastoid process; while sometimes the pain is at the process, when there is found at last that a large anterior abscess exists near the antrum, the latter being full of pus. In some instances the posterior mastoid boundary is sensitive to pressure, but it is found finally that there is no affection of the posterior group of mastoid cells, but that the sigmoid sinus is denuded by an abscess of the anterior mastoid cells. If the operator discovers an antrum full of pus he may not deem it necessary to seek further for diseased bone. If the antral lesions are slight he more willingly seeks further for disease, in all directions about the antrum. In acute as well as chronic infections antrotomy constitutes the most important and the most useful of interventions. But it is only the initial step, for whether the antrum be full of pus or contain only fungous granulations, whether the probe leads the surgeon into sinuses or strikes against a wall apparently healthy, it is important to expose as thoroughly as possible the entire system of so-called mastoid cells, in order to find out the condition of the mastoid cavity, by removal of the cortex from base to point. There is, of course, some risk of infection of healthy bone by pus from the diseased antrum, but on the other hand this radical examination of the bone may expose a purulent nidus that neither the clinical symptoms nor minute exploration of the periantral region have led the surgeon to suspect. Hence Lombard concludes that careful denudation of the cells should not be reserved exclusively for the operative treatment of chronic mastoiditis.

Correlation of 100 Successive Mastoid Operations.—E. W. Pyle [1] submits the following conclusions regarding the correlation of 100 successive mastoid operations in F. Whiting's clinical service, in the New York Eye and Ear Infirmary. Children (numerically 4 less than adults) furnished 3 times as many acute cases, adults 3 times as many chronic cases as the children, illustrating that the greater number of mastoid inflammations sooner or later demand surgical interference. Thirty-seven cases of subperiosteal accumulations and 11 adults giving evidences of having had cortical perforations show clearly the insufficient efforts nature had made to repair, as they had finally to submit to operation. Forty-five acute cases furnished 32% of the intracranial complications, of which 4 died, illustrating the value of normal periosteums and the phagocytic properties of white corpuscles to resist pathogenic invasion, and especializing the importance of prophylactic treatment. Four cases were operated upon perhaps too early and ill-advisedly, but beyond the possibility of a doubt 96 would have been vastly benefited by earlier operative procedure.

[1] Arch. of Otol., June, 1901.

Nonoperative Acute Inflammation of the Mastoid Cells.—Gorham Bacon [1] states that of 40 cases of acute purulent otitis media complicated by acute inflammation of the mastoid cells, it was necessary to perform a radical operation on the mastoid in only 10 cases. In 75% of the cases, therefore, the mastoid was not operated upon. [Avoidance of septic treatment of the primary inflammation of the ear by patients before the physician is summoned, and very conservative treatment by the physician, will reduce the occurrence of consecutive mastoiditis in acute otitis media to a very low percentage. In any case the surgeon should be slow to operate on the mastoid in acute cases, unless continued bad symptoms viz., pain, pyrexia, and prolapse of the inner upper end of the auditory canal, make such operation plainly indicated.]

Radical Operations on the Mastoid.—In a radical operation upon the mastoid in a case of chronic suppuration of the attic with perforation in the membrana flaccida, C. Biehl [2] prefers to open first the aditus by removal of its lateral wall. Then the surgeon may remove all or part of the outer wall of the attic, or of the antrum, or both, according to the demands of the case. This method preserves most surely the integrity of the facial nerve, Biehl thinks, and permits an exploration into the attic in front and the antrum behind, and decides how far an operation upon them may be necessary. Thus in many cases the membrana tympani and ossicula are found not to require removal, and after the purulent nidus from the aditus and the antrum is removed the attic and the ossicula are healed, the running is checked, and the hearing is greatly improved.

Effects of the Radical Mastoid Operation on the Hearing.—The influence of the radical operation on the hearing, as exemplified in 216 cases in Lucae's clinic, in Berlin, is thus set forth by F. Grossmann: [3] "(1) In cases with intact labyrinth the operation brings about an improvement in hearing (48.5%), especially when the hardness of hearing before the operation has been considerable. (2) No alteration or perhaps a diminution of hearing sometimes takes place in these cases (20.2% and 31.3% respectively). (3) In cases in which before the operation the functional test shows full integrity of the inner ear to be wanting, the hearing most frequently remains unchanged by the operation (45.9%). (4) In 38.8% of the cases in this category there occurs a fair amount of improvement in the hearing. (5) The occurrence of a diminution of hearing is here most unlikely (15.3%)."

Perisinus Abscess.—N. Taptas [4] reports the occurrence of a perisinus abscess consecutive to an acute purulent otitis media, coming on after entire cure of the otitis in a young woman of 19. The mastoid was eburnated and the antrum normal. The infection of the perisinus region took place by diapedesis of microbes from the drum-cavity during the acute otitis and continued after the disappearance of the latter. Entire recovery ensued after evacuation of the sinus abscess through the mastoid region.

[1] Arch. of Otol., Apr., 1901.
[2] Arch. f. Ohrenh., June 20, 1901.
[3] Arch. f. Ohrenh., June 20, 1901.
[4] Ann. des Mal. de l'Oreille, Feb., 1901.

Sinus Thrombosis.—Grunert and Zeroni,[1] with their wide experience, maintain that it is best to "operate in every case of even apparently hopeless otitic pyemia, unless it is evident that there is a complicating purulent meningitis." Adherence to this principle has saved many apparently hopeless cases, among which one is mentioned by these authors as having presented unmistakable signs of gangrene of the lung, but which entirely recovered after operation on the sinus.

Modified Operation for the Relief of Otitic Thrombosis of the Sigmoid Sinus.—Hölscher,[2] after stating that in operations on the thrombosed sigmoid sinus there are necessary radical removal of all diseased tissue, the procuring of an absolutely aseptic sinus wound, and the prevention of every possible infection of the latter, proposed the following method of operation in such cases: After the presence of a sinus thrombosis is fully established, the sinus should be freely exposed above and behind its knee, before opening it. Of course, a puncture for assurance of the diagnosis is allowable. As a rule, it will be sufficient to lay the sinus bare for about 2 centimeters beyond its knee. If at this point no disease is found, a longitudinal incision should be made in the sinus (if undoubtedly normal) after careful cleansing with damp bichlorid mops. All pressure upon or stroking the sinus must be avoided. The hemorrhage should be controlled immediately by compression of the sinus with sterile compress above the wound. Thereupon the incision should be conducted downward over the thrombosed portion, the thrombus completely removed, and the diseased sinus wall cut away. The compressing tampon above is now removed (a slight hemorrhage will do no harm) and then above the end of the incision a tampon should be again applied so that the bleeding is checked by pressing the sinus walls together. Upon the tampon is placed a strip of iodoform gauze, which holds the healthy portion of the sinus away from all other parts. The diseased part of the sinus is specially tamponed by itself. (Fig. 111.) As far as the diseased region the skin wound is sutured over the tampons and smeared over with airol paste. In the course of several days the dressing of the anterior part of the operative wound, ear, mastoid, and diseased sinus should be changed without disturbing the posterior tampon, which should be allowed to remain undisturbed for from 8 to 10 days, until the wound in the sinus is

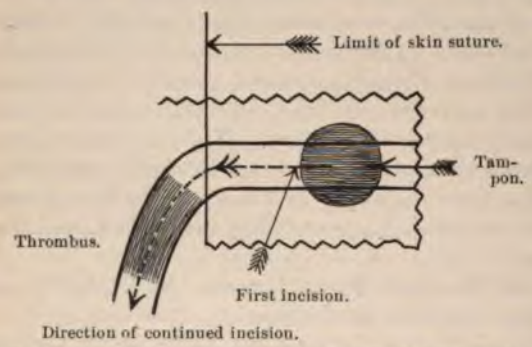


Fig. 111.—Diagram of sinus operation (Hölscher): The wavy line indicates the edge of the opening in the bone.

[1] Arch. f. Ohrenh., June 28, 1901, S. 102. [2] Arch. f. Ohrenh., June 20, 1901.

entirely healed. For this reason iodoform gauze should be used, and for the exposure of the posterior part of the sinus, as well as for the opening of the sinus, fresh instruments should be used. If the suppurative process at the thrombosed spot has already advanced so far that the sinus is destroyed and gangrenous, all purulent matter below can be first scooped out and then the operation further carried out. Before operating on the sinus it is highly advisable to finish the tympanomastoid operation, and if necessary ligate the jugular vein. The great advantage of this method is that the surgeon is protected against overlooking of a metastasis lying higher up and also against possible infection of the healthy sinus, as nothing but the knife comes in direct contact with the interior of the healthy sinus. Furthermore, we may expect primary healing of the sinus wound under the first dressing, while the anterior part of the wound is always separately accessible. By reason of the tampon upon the upper part of the sinus, the later parts of the operation can be conducted with entire freedom from bleeding. Removal of the tampons at the first change of dressings must be carried out with great carefulness; later the dressings can be changed more readily. The sutures should remain in as long as possible, preferably until after the first change of the deep tampons. In some instances this operation may be completed in two sittings.

Air Embolism in Sinus Operations.—An exploratory operation, often necessary, on the sigmoid sinus, is not complete until the sinus wall is opened and the lumen examined by eye and curet, the aspirating needle being incompetent to demonstrate the existence of a parietal thrombus. In order to prevent air embolism, very likely to occur in such an operation if the sinus is not entirely occluded, E. Meier [1] suggests the following plan that he has found entirely satisfactory: "After thorough exposure of the sinus I push firmly in between the bone and the sinus, toward the heart, a tampon. This is followed by immediate swelling of the sinus to a large blue-red ridge. Then the blood is pushed carefully from the sinus toward the brain, and when thus emptied, a firm tampon is placed here between the bone and the sinus. The sinus now lies free from blood before the surgeon. If it be free from pathologic contents, the walls lie close together. If, however, there is not too small a thrombus in the shut-off part of the sinus, the finger can detect the obstruction, provided there be no great pathologic change in the sinus wall. In any event the surgeon may now cut open the sinus without danger to the patient, and fully and accurately inform himself as to the contents of the sinus and the condition of its walls. If the sinus is found to contain a thrombus, the end of which, however, extends beyond the empty part of the blood-channel, the bone over the sinus must be further removed and a new tampon pushed in between the bone and the sinus, and the latter further incised, until the end of the thrombus is reached. This method of search, however, has its limit in the sigmoid sinus, for when the lateral sinus is reached the superior petrosal sinus is also reached and hemorrhage from the latter will occur.

[1] Arch. f. Ohrenh., Aug., 1900.

The point of entrance of this latter sinus into the lateral should be tamponed, however, and then the lateral sinus can be fully investigated under freedom from blood by continuing the method of tamponade between bone and sinus. If the thrombus is very extensive, the lumen of the sinus should be thoroughly tamponed. If, however, the thrombus is only a small parietal one, the removal of which has been successfully accomplished, I do not tampon the lumen, but simply lay a gauze compress on the sinus wall, and then restore the circulation in the sinus by removal of the inhibiting tampons. If the sinus wall has been altered through inflammation, danger of fresh infective thrombosis does not exist after removal of the original causative purulent focus in the ear."

Otogenous Pyemia.—F. Kretschmann [1] observed 3 cases of otogenous pyemia, of which the first was characterized by extensive thrombosis of the cranial sinuses, the second by the rapidity of development of the pyemia, and the third by the complication of the pyemia by endocarditis. In the first case, a woman of 68, subject of chronic purulent otorrhea, thrombosis began on the left side in the transverse sinus, and extended finally through the torcular and involved the right transverse inferior petrosal and cavernous sinuses and the upper part of the right jugular vein. In this same case there was found, during an exploration of the cerebellum for a supposed abscess, an encapsulated collection of serous fluid, the nature of which was not explained, either at the operation or at the autopsy. The second case, a boy of 4, is remarkable for the rapidity with which thrombophlebitis developed after an acute otitis media. Symptoms of pneumonic metastasis set in on the fourth day of the otitis. [This is another instance in which the ear-disease in a child caused the pneumonia.] In this case, as the drum-cavity and the antrum showed very little change, the author supposes that in this child there occurred a metastasis by a leap and not by contiguity, such leaping method of formation of a suppuration far from the primary seat in the ear being not uncommon in otopathology. In the third case, a boy of 9, with foul chronic purulent otorrhea, typical symptoms of pyemia and endocarditis occurred, with remarkable variation in temperature, viz., from 96° F. to 106° F., followed, however, by entire recovery of health. The bony cochlea was thrown off as a sequestrum in this case 6 months after the first pyemic symptoms. The aural discharge then ceased.

Otitic Pyemia; Diagnosis and Treatment.—Dundas Grant [2] points out the fact that when in otitic pyemia the metastases affect the joints or the general circulation, there will be found in all probability a pyemia without thromboses. If, on the contrary, in a chronic purulent otorrhea of a year's standing there are evidences of metastases in the lungs or in the pleura, there is very little doubt about the existence of a thrombotic pyohemia. This is confirmed if there be abnormal tumefaction of the external jugular, which is indicative of obstruction

[1] Arch. f. Ohrenh., Sept. 20, 1900, S. 54.

[2] Thirteenth Internat. Med. Cong., Paris, Aug., 1900; Ann. des Mal. de l'Oreille, Oct., 1900.

in the internal jugular vein. Tenderness and swelling in this region indicate a phlebitis or at least an inflammation of subjacent glands. Swelling in the contents of the orbit, with dilation of the retinal veins, indicates obstruction in the cavernous sinus. Furthermore, great sensibility behind the mastoid region leads to the suspicion of the invasion of the condyloid or vertebral veins. Greater certainty in diagnosis is impossible until the sigmoid sinus is exposed. After such exposure absence of fluctuation between the sinus and the internal jugular vein would indicate complete obstruction. If an exploratory puncture gives vent to pus, it can be asserted that there has been thrombosis followed by purulent disintegration. The escape of pure blood at such a time indicates nothing of importance, because it can occur notwithstanding a parietal thrombus. A negative puncture reveals the presence of a thrombus, or at least obliteration of the blood-channel. *Treatment:* The treatment of otitic pyohemia, as shown by Grant, consists in the suppression of the cause of infection or of the poisoning of the blood, the evacuation and sterilization of all the secondary pyogenic foci, and prevention of the transmission of septic matters in the circulation. Furthermore, there should be administered remedies promotive of the elimination of toxins from the blood and those also calculated to maintain the strength of the patient until such elimination be accomplished. Finally, some form of antitoxic serum should be injected to destroy the toxins generated by the microbes. In acute cases, if the symptoms are rebellious to treatment, especially if antistreptococcic serum has been administered without effect, the surgeon may suspect that a parietal thrombus has formed in the sigmoid sinus or in the jugular bulb. In such instances it may be necessary to explore and operate in the manner indicated in chronic cases—that is, ligation of the jugular, incision, evacuation, and obliteration of the sigmoid sinus. Ligation of the jugular should not be performed without simultaneous opening of the sigmoid sinus. In chronic cases the radical mastoid operation should be performed promptly; but if there is evidence of thrombophlebitis of the jugular, the latter should be laid bare and ligated or at least emptied of its diseased contents before operating upon the mastoid. Generally, in a case of otitic pyohemia, after the mastoid operation, the sigmoid sinus is laid bare by extending the opening in the bone and the sinus explored with an aspirating needle. If there is thrombosis and purulent disintegration has set in in the upper part of the sinus, the affected region should be generously opened and the purulent debris removed until clot of a healthy appearance is reached; then the cavity should be disinfected with corrosive sublimate lavage, insufflation of iodoform, or iodoform and boric acid mixed, and then lightly tamponed with iodoform gauze. If the chills recur it will be necessary to open the sinus in both directions and detach the clots until there is a free escape of pure blood. Then the cavity must be filled again with tampons of iodoform gauze. In such cases the majority of operators advise ligating the internal jugular and then to act according to circumstances as follows: If the vein is thrombosed it should be tied as low down as possible, then cut, and

the upper part drawn out at the upper part of the incision, when its contents should be removed with either curet or syringe. If there be no thrombosis, the superior part of the vessel should be tied and cut. In all cases the sinus should be completely emptied and then sterilized and lightly tamponed. Tampons should be removed from the sinus at the end of 24 hours at the latest and then renewed. When the temperature continues high and the patient's strength fails rapidly, it becomes necessary to administer either antitoxic or normal serum. If the pyohemia appears to be complicated with meningitis, lumbar puncture should be performed. If the resultant liquid is purulent, it is useless to continue the operation on the head. If, on the contrary, there is evidence of serous meningitis, intervention is all the more indicated. When there exists either a simultaneous cerebral or cerebellar abscess, the latter should be evacuated by an opening in the skull as far as possible from the diseased sinus. Metastatic abscesses should be opened as fast as they form.

G. Laurens [1] reports a unique case of **diffuse cranial ostitis with thrombophlebitis** of the diploe, of otitic origin, in a woman of 66, the subject of a mastoiditis that had extended into the adjacent occipital cells. C. Poli [2] reports the occurrence of a fatal thrombosis of the transverse sinus without pyohemic symptoms, in a young man of 20, the subject of a subacute otomastoiditis. The explanation given of the negative symptoms in this case is that the formation of a thrombosis in the lateral sinus, not being followed by purulent fusion in the latter, instead of causing pyemic symptoms, produced, by way of the circulation, a serous meningitis. The question naturally arising is, How should the surgeon proceed if such a condition could be diagnosed during the life of the patient?

Brain Abscess.—M. Ruprecht [3] has reported the occurrence of an otitic brain abscess occupying a large portion of the left hemisphere, characterized by purulent spinal fluid, and running a course similar to that of cerebrospinal meningitis in a man of 23, the subject of chronic purulent otitis media. Lumbar puncture was performed, but no further operation was undertaken. The patient died on the eighth day after having entered the hospital as a sufferer with "a febrile, suppurative ear-disease."

Ménière's Symptoms, Not Méniere's Disease.—A. C. H. Moll,[4] basing his conclusions on the physiology and the pathologic anatomy, states that the entire group of Ménière's symptoms may be due to a simple modification of intralabyrinth pressure. The latter may be dependent upon a variety of causes, among which the nervous element plays a preponderating part. Hence it is impossible to apply exclusively the name "Ménière's disease" to a hemorrhage in the semicircular canals for various reasons; *e. g.*, (1) insufficient anatomicopathologic observations; (2) the confusion induced by the diversity of etiology; (3) the great difference really existing between the apoplectic form and

[1] Thirteenth Internat. Med. Cong., Paris, Aug., 1900; Ann. des Mal. de l'Oreille, Oct., 1900.
[2] *Ibid.*
[3] Arch. f. Ohrenh., Dec., 1900.
[4] Ann. des Mal. de l'Oreille, Dec., 1900.

others; (4) the infinite minority of apoplectic cases compared with those in which there was an anterior aural lesion. In order not to increase the confusion already caused by the term "Ménière's disease," Moll proposes to abandon this name for the term "Ménière's symptoms," in accordance with the suggestions of Brunner, von Fränkl Hochwart, and others. As these symptoms are caused by the irritation of the labyrinth from various sources, he suggests the following classification for Ménière's symptoms according to the seat and nature of the causative irritation: (*a*) Affections of the external ear; (*b*) affections of the middle ear, acute and chronic; (*c*) affections of the internal ear, hemorrhagic, traumatic, acute, chronic, and tonic; (*d*) affections of the acoustic nerve, tabes, neoplasms, and neurosis, like angioneurosis. Moll disregards those forms of vertigo in which there is no alteration of hearing, "since **without aural disease there can be no Ménière's symptoms.**" The author calls attention to the fact that Ménière himself declared that the symptoms we call by his name may be "engendered by modification in the intralabyrinth pressure transmitted through the chain of ossicles, after changes in the condition of the middle ear and even of the internal ear." [These are almost verbatim the conclusions drawn by C. H. Burnett, and set forth in a paper read before the Philadelphia County Medical Society in 1880. We are very glad to report that Moll and others have arrived at the same conclusions, because it is only by following such a chart that a correct diagnosis can be reached and a rational therapeusis applied.]

Labyrinth Angioneurosis with Ménière's Symptoms.—A case of angioneurosis of the labyrinth occurring in a woman of 42, accompanied by Ménière's symptoms, is reported by Jörgen Möller,[1] from the clinic of Holger Mygind. Pilocarpin in this case, as in many other labyrinth affections, showed itself to be a useful remedy, its employment being followed by cure.

A Case of Agoraphobia Mistaken for Ear-vertigo.—F. Kretschmann [2] reports a case of agoraphobia occurring in one of his patients, a man of 50, cured 8 years before of chronic purulency localized in the attic of the left middle ear. The membrana tympani was destroyed. Vertiginous symptoms had often occurred. After several weeks the suppuration was checked, but the vertigo continued. In the following years the patient's ear was known to have remained healed and his general health had been good. Much to the surprise of Kretschmann the patient suddenly presented himself with his wife and stated that he was unable to walk alone for fear of falling. This condition had occurred suddenly a few weeks previous without any assignable cause, and had grown worse by degrees until its present stage had been reached. An examination of the ear had revealed shining epidermis everywhere, without a trace of pus or the presence of fetor. The patient presented an anxious expression of countenance, his attitude was bent over, and he seemed timid. When he was led through the room he showed no tendency to fall sideways. His gait was sliding, his feet not being

[1] Arch. f. Ohrenh., Aug., 1900. [2] Arch. f. Ohrenh., Sept. 20, 1900, S. 61.

lifted. Standing with feet together and eyes closed, there occurred no swaying. The patellar reflexes were normal. In trying to walk alone the patient shoved his left foot carefully forward and then drew the right one after it, like one crossing a narrow foot bridge. With his hands he quickly sought a support. In fact, the patient presented well-marked symptoms of ear-vertigo. The patient was assured, however, that his ear was in good condition, there was no sign of recurrence of the purulency, and that his present condition of vertigo was not due to his ear, but was of a nervous nature. He was also assured that regular exercise would overcome his uncertain gait, and he was immediately told to take several long steps. This succeeded beyond expectation and he walked better at every repetition of the exercise. Three days later he reported again in high spirits over the good results of his exercises in walking. He held himself erect and walked perfectly well and continued to do so thereafter. The good results in this instance can be ascribed to a form of suggestion or hypnotic treatment.

Disorders of Equilibrium Caused by Diseases of the Labyrinth.—S. von Stein [1] draws attention to the important fact that lesions of the labyrinth, the trunk of the eighth nerve, and of the medulla oblongata may be attended by a great number of identical symptoms difficult to explain even in the mildest cases. He divides the symptoms of diseases of the labyrinth into two groups, viz.: (*A*) Symptoms of lesions of the function of hearing, and (*B*) symptoms of lesions of the motor function. The latter group is subdivided into two parts: (I) Subjective symptoms of disturbed equilibrium: (*a*) Vertigoes—*i. e.*, apparent movement of visible objects, the eye being open; sensation of rotation of the body, the eye being closed, etc.; (*b*) nausea; (*c*) inability to determine the direction of motion; (*d*) feebleness or loss of sensation of apparent inverse rotation. (II) Objective symptoms of disorders of equilibrium, static and dynamic: (*a*) Disturbances in the motor function of the legs; (*b*) disturbances in the motor function of the arms (Guye); (*c*) disturbances in the motor function of the trunk; (*d*) disturbances in the motor function of the head; (*e*) vomiting; (*f*) sudden falling, with or without loss of consciousness; (*g*) disturbances in the movement of the eye: (1) nystagmus during active movements of the head; (2) disturbances in the movements of the eye (nystagmus) during centrifugation (passive motion); (3) disturbances in the movement of the papilla (Bonnier). The symptoms of these two groups may form combinations with one another with resultant clinical phenomena of a very complex nature. Stein draws attention to the fact that in the motor disturbances described above as occurring in lesions of the labyrinth "it is not muscular force that is wanting in the management of the limbs, but the capacity to impress upon them a regular and rational direction."

Rheumatic Affections of the Auditory Nerve.—According to the investigations of V. Hammerschlag, [2] rheumatic paralysis of the

[1] Thirteenth Internat. Med. Cong., Aug., 1900; Ann. des Mal. de l'Oreille, Dec., 1900.

[2] Arch. f. Ohrenh., June 20, 1901.

auditory nerve is due to injury arising from exposure to cold, which injury in some instances is irreparable, leading to permanent reduction in the hearing power and altered function in the semicircular canals, while in other cases the entire recovery takes place. The cause of this varying intensity is unknown, and precise localization of the pathologic changes in the various parts of the auditory tract is impossible, as no positive pathologic anatomic discoveries have been published.

Psychopathies of Aural Origin.—It is asserted by A. Torretta [1] that often maniacal attacks, sudden vertigoes, melancholia in individuals without the least hereditary neurotic taint, are often due solely to ear-disease, since they have been entirely relieved as soon as the aural symptoms have been overcome by surgical means.

[1] Ann. des Mal. de l'Oreille, May, 1901.

DISEASES OF THE NOSE AND LARYNX.

By E. FLETCHER INGALS, M.D., and HENRY G. OHLS, M.D.,
of Chicago. of Odell, Illinois.

Collapse of the Ala Nasi.—W. J. Walsham,[1] after trying a variety of tubes and appliances to relieve collapse of the ala nasi, obtained permanent satisfactory patency by the following simple plastic operation. Under general anesthesia a strip of mucous membrane as thick as possible and about $\frac{3}{16}$ inch wide is dissected up from the inner wall of the vestibule, leaving the upper end attached just within the upper angle of the nostril. The epithelial covering of the strip and of the adjoining "pit," corresponding to the angle of bending of the lower lateral cartilage, is then removed. The strip is then rolled upon itself into the pit and is retained in contact with the raw surface of the pit by a stitch of fine fishworm-gut passed through the septum. The roll of tissue presses out the external portion of the lateral cartilage sufficiently to prevent the ala collapsing against the septum during inspiration and granulates over.

Nasal Deformity.—Watson Cheyne[2] converted a saddle-nose resulting from an old injury to a fine Roman outline by a plastic operation, using the femur of a rabbit just killed by chloroform to replace the nasal bones. The patient was a youth aged 18, who had received a severe injury of the nose 6 years before. St. Clair Thomson,[3] in commenting on the above operation, points out that it was done for traumatism and that syphilis offers less favorable cases for its application.

Restoration of the Nose.—M. Berger[4] described an ingenious apparatus invented by Goldstein to replace the nose, palate, and lacrimal ducts lost by conjugal syphilis. It enabled the patient to speak intelligibly, to masticate and swallow without trouble, besides making an object of horror presentable. The mechanism is in two parts, the nasal and the palatal, which are inserted and fastened together by the patient.

Nasal Hydrorrhea.—B. Berens[5] reports the cure of a patient with hydrorrhea by the use of **suprarenal extract** in 5-grain doses every 3 hours. C. P. Linhart[6] reports equally effective a spray of **Dobell's solution** with a dram of suprarenal extract to the ounce. His patient

[1] Lancet, Mar. 30, 1901.
[2] Practitioner, Jan., 1901.
[3] *Ibid.*
[4] Bull. de l'Acad. de Méd., Oct. 9, 1900.
[5] Ann. of Otol., Rhin., and Laryn., Aug., 1900.
[6] *Ibid.*

had a recurrence of the discharge in the winter, but it yielded promptly to the same local treatment. Lermoyez [1] describes nasal hydrorrhea as an accident of arthritism or neuroarthritism like migraine. Local lesions such as polypi, sneezing, and sensitive spots he considers secondary to the discharge. He therefore obtains better results in 20 days' treatment with **atropin and strychnin** internally than by the usual endonasal operations. [Similar treatment in our hands has proved utterly futile.]

Epistaxis.—Wm. Lamb [2] quotes Arbuthnot Lane to the effect that **precipitated sulphur** applied with a pledget of cotton or gauze to raw surfaces acts as a strong caustic on fresh wound surfaces, less actively on granulating wounds, and not at all on normal membranes. He has thus used it to check epistaxis in certain cases. Lewis A. Somers,[3] to control persistent bleeding from the septum, had **adrenal solution** applied over the bleeding area at infrequent intervals for several weeks. The patient, a traveling man, had had almost daily or nightly epistaxis for several months. There was intense congestion of the right side of the septum with enlarged vessels, though they did not appear angiomatous nor was there a history of hemophilia. The septum became pale and the vessels contracted to their normal size after the treatment and the bleeding has not recurred during the past year. The writer used:

℞.	Acid carbolic	gr. j
	Adrenals	gr. x
	Aqua	℥j.
M. filtra.		

To this he prefers to add enough eucain to make a 1% to 3% solution, thus having an anesthetic as well as hemostatic. [We have used sprays of **adrenalin chlorid** with most satisfactory results, but believe that when there is a visible vessel bleeding persistently, the diameter of a pin, the galvanocautery is the most successful application. The products of adrenals are especially advantageous in the epistaxis of children.] G. W. Squires [4] describes repeated and nearly fatal attacks of epistaxis in a man of 50, without apparent cause. Some months later a rusty needle projected through the right nostril and was removed by tweezers.

Adrenalin Chlorid.—Emil Mayer [5] reviews the experiments of different chemists in isolating the blood-pressure-raising principle of the adrenals. The writer believes Jokichi Takamine's discovery of adrenalin marks an epoch. His conclusions follow: (1) Adrenalin solutions supply every indication in rhinologic practice. (2) They can be used in sterile forms. (3) They remain unchanged a long time. (4) A solution of 1 : 1000 is very strong and is sufficient for all operative cases, and 1 : 5000 or 10,000 for every purpose of local medication. (5) They may be safely applied to persons of every age and of either sex. E. Fletcher Ingals [6] finds that the solution of adrenalin chlorid of the

[1] Jour. of Laryn., Rhin., and Otol., Aug., 1900.
[2] Birmingh. Med. Rev., Aug., 1900.
[3] Phila. Med. Jour., Mar. 2, 1901.
[4] Med. Rec., Dec. 22, 1900.
[5] Phila. Med. Jour., Apr. 27, 1901.
[6] Jour. Am. Med. Assoc., Apr. 27, 1901.

strength of 1 : 5000 acts with about the same rapidity and intensity as the solution of 30 grains of desiccated adrenals in 1 ounce of water. In solutions of adrenalin chlorid, 1 : 5000 of normal salt solution, which were frequently opened, the writer found fungus formed at the bottom within a few days. This has not yet appeared after several weeks in a solution made with 1 part of adrenalin to 5000 of liquid containing 8 grains of boric acid, 2 drams each of cinnamon and camphor water, and 4 drams of distilled water. He is convinced by numerous experiments that the remedy will be of great value in the treatment of acute inflammatory affections of the nasal cavities, either in sprays of about 1 : 5000 or in powders of from 1 : 5000 to 1 : 2500 of sugar-of-milk. These may be used several times daily, and they will reduce the congestion and swelling for periods of 2 or 3 hours or longer. In hay-fever and acute coryza the author expects to obtain great relief from the use of the solution above mentioned. In epistaxis it will be beneficial and in many cases curative. In chronic rhinitis the secretions have been markedly checked by the same solution. In acute inflammations of the fauces the weaker solutions are of little value, but in the strength of 1 : 1000 will doubtless have good effects. The stronger solution also gives very great relief in acute and subacute laryngitis, and it appears probable that when applied to acutely congested cords in vocalists it will reduce the congestion and swelling so thoroughly that the voice may be used for 2 or 3 hours with comparative ease.

Nasal Stenosis.—Scanes Spicer [1] claims that a slightly obstructed nostril has a more deleterious effect as a cause of chronic catarrhal changes in the nose and ears behind the obstruction than a more completely blocked one, since in the former case there is, from the diminished air-tension, a more constant engorgement than in the latter; for in such latter subjects mouth-breathing is necessarily more frequently, if not exclusively, resorted to, and this habit, though attended by its own bad results on the pharyngeal, laryngeal, and bronchial mucous membranes, does not so directly injure the membranes of the throat and ears. The author attributes most cases of nasal obstruction to injuries in childhood, and he notes the greater liability of rickety children to falls while learning to walk. [We have frequently observed the more deleterious effects of partially obstructed nares referred to by the author, but cannot agree with his conclusions as to the causes of these obstructions. From our observation most deflections and exostoses of the septum appear to result from chronic congestion with consequent over-nutrition, and they seem to begin about the age of puberty.]

Nasal Conditions in the Aged.—Beaman Douglass [2] discusses the lack of catarrhal symptoms, pain, obstruction, and secretion, commonly observed in the aged with marked hypertrophy or deflected septum with increased connective-tissue development. He draws a parallel between the above condition and the similar cirrhosis developing in the brain, liver, kidneys, and other organs without symptoms. Various theories

[1] Jour. of Laryn., Rhin., and Otol., Sept., 1900.
[2] N. Y. Med. Jour., May 25, 1901.

are set forth by the author to account for the lack of symptoms in these cases, sometimes also observed in younger persons. His conclusion is that temperament and especially a neurotic tendency account for the more active symptoms usually observed in the young as compared with the aged. He also draws attention to the fact that chronic congestive interference with the circulation, lymphatic obstruction, and the neurotic temperament are important elements in nasal cases, and that the cure of patients who suffer from nasal symptoms often will not result from the mere mechanical removal of the nasal lesion.

New Technic for the Reduction of Turbinal Hypertrophies.—M. A. Goldstein,[1] following the method recommended by Norval H. Pierce for the submucous cauterization of turbinal hypertrophies, devised a trocar and probe (Fig. 112) to facilitate the operation. The technic is as follows: (1) The area to be operated on is cocainized as usual.

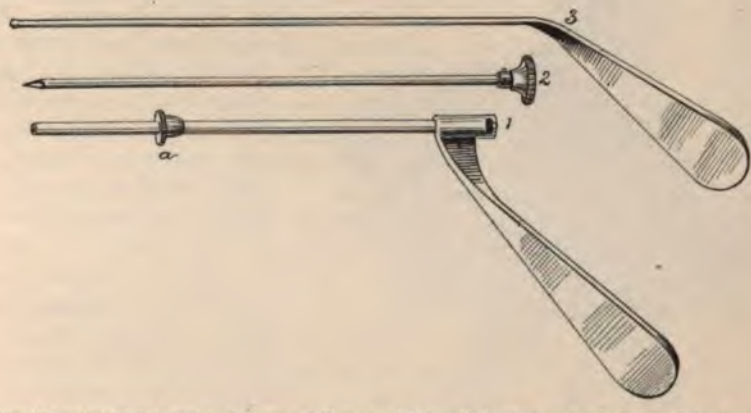


Fig. 112.—Goldstein's turbinal trocar: *1*, Trocar, with handle bent at an angle to permit best manipulation; *2*, obturator, with sharp point and bayonet fitting for locking in trocar; *3*, probe, with blunt end and handle at same angle as trocar; *a*, sliding ring to indicate depth of penetration of trocar (Goldstein, in Laryngoscope, May, 1901).

(2) The obturator is adjusted to the trocar and locked in position, and the sliding ring is then adjusted on the trocar to the length of the hypertrophy to be cauterized. The sharp trocar is then introduced into the hypertrophied mass parallel with the turbinate bone and hugging the surface of the bone as closely as possible, until the ring-guard is reached. (3) The obturator is now withdrawn from the trocar and the probe with the cup-shaped end, upon which a bead of chromic acid has been fused, is introduced through the trocar to the area to be cauterized. This probe also carries a sliding ring which may be so adjusted that the probe projects about ¼ inch beyond the distal end of the trocar. With the probe still projecting both it and the trocar are then withdrawn. In this manner the acid is brought in contact with the whole length of the hypertrophy. (4) The author then applies a spray of camphomenthol and introduces a cotton tampon saturated with benzoinol into the naris

[1] Laryngoscope, May, 1901.

to maintain a moderate pressure during the healing. The following advantages are claimed by the author for this method: (1) Simplicity of technic and the short time required; any portion of the turbinate can be reached from one small point of incision; (2) freedom from pain during and after the operation; (3) no hemorrhage or liability of infection; (4) no destruction of physiologically vital tissue. There is no formation of synechiæ, as all inflammatory exudate is submucous.

Deflection and Exostosis of the Septum.—E. J. Moure,[1] in cases of deflection with a spur, first removes the spur by means of his osteotome (Fig. 113).

When the deviation is too great to allow the introduction of the osteotome over the spur, he first cauterizes one or two channels in the cartilage and removes with cutting pliers enough tissue to allow the passage of the osteotome. After shaving off the projecting spur he controls the hemorrhage by the application of the cautery knife over the raw surface. Packing he finds unnecessary and commonly uses no after-dressing, but allows the patient to rest for 24 to 48 hours. In cases presenting deviation, a spur, and also a luxation of the fibrocartilage at the anteroinferior part of the septum, the author resects the projecting edge of cartilage in the usual manner, stitching the cut mucous membrane. Eight or 10 days later he removes the spur. In about a month, or when cicatrization is complete, with angular scissors he cuts through the septum along its base about 2 or 3 centimeters, and also makes an incision along the anterior border the length of the nasal ridge. The septum is then maintained in position by a special tube with a rigid side toward the turbinate and a flexible side to be molded by forceps to the septum and to be worn 7 or 8 days (Fig. 114). [This operation appears to us of limited application and not superior to the usual methods.]

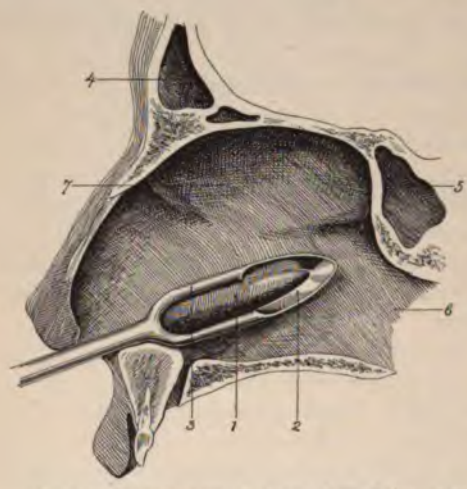


Fig. 113.—The osteotome *in situ*: *1*, Spur of the septum grasped in the lumen of the instrument; *2*, cutting blade; *3*, blunt part acting as ring guide; *4*, frontal sinus; *5*, sphenoidal sinus; *6*, posterior nasopharyngeal edge of the vomer; *7*, perpendicular plate of the ethmoid (Moure, in Jour. of Laryn., Rhin., and Otol., Apr., 1901).

A Tubular Septum Saw.—Sidney Yankauer[2] devised a saw made from a section of steel tube a half inch in diameter and comprising about one-fourth of the circumference of the tube. The author claims that it

[1] Jour. of Laryn., Rhin., and Otol., Apr., 1901.
[2] Ann. of Otol., Rhin., and Laryn., Aug., 1900.

is an improvement over flat saws for the removal of spurs at the base of the septum. The teeth are applied flat against the base of the growth and take immediate hold. As the sawing proceeds the saw rotates so as to cut upward and even outward, leaving a hollow groove. It is not suitable for cases of deflection without thickening of the septum, as it will perforate in such cases. The saw is made in pairs, right and left (Fig. 115).

Deviations of the Septum.—John O. Roe [1] again recommends the ring-bladed forceps (Fig. 116) to correct deviations of the septum, and claims that it is applicable in all forms of deflection, thus being preferable to the flat-bladed forceps or the finger. By this instrument wrinkles or curves can be readily smoothed out, no additional operative measures being required, except for the removal of spurs and ridges or the breaking up of adhesions. Marked deflection requires incision along the prominence and hypertrophied turbinates may require reduction preliminary to straightening the septum.

Fig. 114.—*a*, Metallic tube with rigid wall to the left, soft and flexible to the right, for introduction on the side of the deviation. The portion which depends is intended to be recurved at the entrance of the nostril, so as to insure perfect maintenance of the instrument in place; *b*, dilating forceps to mold the tube against the deviated cartilage; *c*, forceps placed inside the tube and making the desired molding (Moure, in Jour. of Laryn., Rhin., and Otol., Apr., 1901).

Electrolysis in Atrophic Rhinitis.—C. M. Cobb [2] concludes his study of electrolysis as follows: (1) Electrolysis has a curative action in atrophic rhinitis so far as it stops the tendency to crust-formation and the odor, in typical cases. (2) It does not stop the discharge or odor if these are caused by nasal empyema. (3) Better results are obtained if the needles are placed comparatively close together. (4) It makes no difference in the result what metal is used for needles, and it therefore follows that the diffusion of the copper salt is evidently not the curative agent. (5) The improvement in the condition of the nasal mucous membrane is not noticeable in the area around the positive pole. (6) This improvement is probably due to the liberation of free oxygen and chlorin, and the chemic change resulting from the presence of free oxygen and chlorin in the tissues or the acid reaction produced thereby. (7) The needle of the negative pole should not be placed beneath the membrane of the septum.

Syphilitic Rhinitis.—Robert Levy [3] attributes the saddle-nose

[1] N. Y. Med. Jour., Apr. 13, 1901. [2] Jour. Am. Med. Assoc., Mar. 16, 1901.
[3] Ann. of Otol., Rhin., and Laryn., Aug., 1900.

deformity to destruction of the nasal bones by tertiary syphilis rather than to extensive destruction of the septum. The latter lesion, when occurring in extensive atrophic rhinitis, he finds associated with a depression at the junction of the bony and cartilaginous septum, more marked laterally. This condition has been named Kneifernase by Heymann. W. Freudenthal [1] made a diagnosis of primary chancre of the septum in a physician who acquired the infection from a vaginal examination of a syphilitic woman, later inoculating the septum by picking his nose. The dryness of the nasal membranes and the stuffy condition at night, with mild fever and enlarged lymphatics in the occipital region and also on top of the head, were for a time attributed to the effects of influenza then prevalent. Locally the sore on the septum resembled an ordinary beginning perforating ulcer. Later the ulcer showed the characteristics of the chancre, the margins being elevated above the level of the mucous membrane, making the diagnosis certain. Soon after a secondary eruption covered the body.

Hay-fever.—L. S. Somers,[2] from experience in the treatment of 21 patients with hay-fever by the internal administration of suprarenal extract, finds that thus given the remedy is of little or no utility.

Fig. 115.—Yankauer's tubular septum saw.

Asthmatic patients found their dyspnea aggravated by the remedy. As a local application the author considers it the most satisfactory single remedy. [We have had considerable experience with adrenals and can confirm the author's view as to its value as a local remedy. We have also observed an aggravation of the dyspnea when using it in asthmatic patients.] H. Holbrook Curtis [3] reports continued favorable experiments in the preventive treatment of hay-fever by the administration of the tincture or fluid extract of **Ambrosia artemisiæfolia** during 2 weeks before the expected attack.

The Pathology and Treatment of Nasal Polyps.—Lambert Lack [4] found by microscopic examination of more than 30 specimens of bone underlying nasal polyps that every case presented the appearance of rarefying osteitis. The change begins with proliferation of the cells in the deeper layer of the periosteum. The bone becomes disintegrated and the fragments, surrounded on all sides by osteoclasts, are slowly eaten away and absorbed. No true necrosis was seen. These appearances were found in both extensive and simple cases of polyp. Upon careful digital examination of the ethmoid region under general anesthesia the soft jelly-like tissue is found, in which spicules and loose pieces of bone can be plainly felt, though it is rare to feel rough, bare bone. This condition may also be detected by a blunt probe properly

[1] N. Y. Med. Jour., May 11, 1901. [2] Phila. Med. Jour., Dec. 8, 1900.
[3] Med. News, July 7, 1900. [4] Jour. of Laryn., Rhin., and Otol., Feb., 1901.

curved, but it is difficult with this instrument to avoid puncturing the softened mucous membranes. The edematous membrane covering the diseased bone in the early stage is indistinguishable microscopically from a polyp, and clinically the former condition passes into the latter by imperceptible stages. The increase in size is doubtless assisted by gravity. The thin mucoperiosteum of the ethmoid region and the lax condition of the mucous membrane of the middle turbinate and the region of the ostia of the accessory sinuses account for the development of polyps exclusively in that area. Acceptance of the author's theory of the causation of polyps demands the removal of all diseased bone whether limited or extensive. He divides the cases into four groups: (1) Cases in which one or two polyps only are present, which are of long standing, in which there is no sign of active disease, and in which it is probable that the initial bone-disease has completely passed off. In such cases simple removal with the snare is sufficient, recurrences being rare. (2) Simple cases of early bone-disease with enlargement of the anterior end of the middle turbinate and edema of the overlying membrane, or the early stage of polyp formation. The diseased tissue should be removed, generally by amputation of the anterior end of the middle turbinate. (3) Cases in which a few polyps only are present, with very limited disease of the bone. In these the polyps may be removed with the snare, but it should be applied as high as possible so as to include in the snare the underlying bone. At a later sitting the affected area should be thoroughly examined by probing and illumination, and all diseased bone and membrane should be clipped away by Grünwald's forceps. The middle turbinate should be removed if diseased or if necessary to give access to the affected region. (4) In the cases of extensive bone-disease with numerous polyps and cases associated with suppuration in the ethmoidal cells or other accessory sinuses, and when polyps have recurred after removal, the author advises a radical operation under anesthesia. After removing the polyps with forceps, the middle turbinate is removed by the spokeshave and the lateral mass of the ethmoid is scraped away by means of a large ring knife such as Meyer's original adenoid curet. This is continued until all friable tissue is removed. Hemorrhage is controlled by a gauze tam-

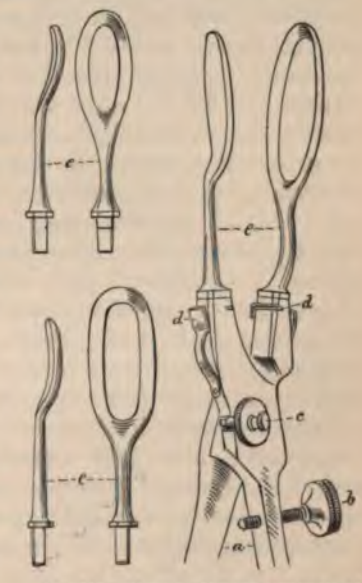


Fig. 116.—Showing the various parts of the instrument: *a*, The handles with blades attached; *b*, the set screw for regulating the adjustment of the blades; *c*, lock permitting the handles to be detached from each other; *d*, *d*, spring catch for holding the blades firmly in the handle; *e*, *e*, *e*, blades of different sizes that fit into the handle (Roe, in N. Y. Med. Jour., Apr. 13, 1901).

pon soaked in glycerin-iodoform emulsion. This may be changed every second or third day for a fortnight, if easily tolerated.

Nonmyxomatous Nasal Polyps.—Jonathan Wright [1] regards the ordinary gelatinous nasal polyp as pendent tissue in the nose, which has assumed that shape because of the effusion of serum into it from the blood-vessels. While occasional embryonal new connective-tissue cells may be seen, there is little or no new formation of tissue, but, on the contrary, a separation of the fibers of the preexisting subepithelial stroma by serous effusion. Myxoma is thus a misnomer as applied to nasal polyps, according to the author's view.

The Nose and the Female Sexual Organs.—A. Schiff [2] proved the observation of Fliess that the pain of dysmenorrhea was relieved promptly, in 34 out of 37 cases, by the application of 20 % cocain solution to the "genital spots" of the nose. Some cases he observed for months and he had over 200 positive results. Hypogastric pain was relieved by cocainizing the turbinate, and sacral pain by application to the tuberculum septi. By first contracting the tissues with suprarenal solution, a 3 % to 5 % solution of cocain was sufficient to stop the pelvic pain. Of 13 negative cases, 4 had fixed retroflexion, 2 adnexal disease, and 1 parametritis. Two patients treated in Chrobak's clinic complained of hypogastric pain immediately upon application of the cocain plug to the corresponding turbinate. In 17 cases the author cauterized the genital spots during the menstrual interval with trichloracetic acid or electrolysis with no return of the dysmenorrhea in 12 cases, 1 being under observation from 1½ to 2½ years.

The Adenoid Face.—Jonathan Wright [3] takes exception to the classification of the high arched palate as one of the effects of adenoids, and on the contrary maintains that the high narrow alveolar arch, usually associated as it is with a general narrowing of the upper face, is a predisposing factor in the causation of adenoids. He quotes Grossheintz [4] to the effect that adenoids occurring in such subjects are very much more apt to produce symptoms, especially of obstruction. William Lamb [5] notes the two types of facial development commonly associated with adenoids in childhood. Each has a common feature, viz., transverse contraction of the upper alveolar arch. In the first type the upper jaw makes up for the transverse contraction by sticking out in front, while the lower jaw retreats and is deficient. In the second type the upper alveolar arch is contracted in both diameters, transverse and anteroposterior, while the lower jaw is relatively prominent. De Champeaux [6] divides his cases as follows: (1) Adenoid faces with adenoids. In this group the consequences of the disease show themselves sooner or later; the voice is nasal, the child hears badly, he has symptoms referable to the ear, nose, larynx, and bronchi, takes cold easily, often has enlarged tonsils. (2) Adenoid faces without adenoids. In this group

[1] Med. Rec., Jan. 26, 1901.
[2] Wien. klin. Woch., ref. N. Y. Med. Jour., Apr. 13, 1901.
[3] Brooklyn Med. Jour., July, 1900.
[4] Arch. f. Laryn., Bd. VIII, H. 3.
[5] Birmingh. Med. Rev., Jan., 1901.
[6] Arch. Internat. de Laryn., Mar.-Apr., 1901.

the mouth is open, the palatal arch is pointed, the teeth badly arranged; the patient snores at night; generally the tonsils are not enlarged; respiration is buccal, and cannot be carried on through the nose. In these patients ear affections readily yield to treatment. (3) Adenoids without adenoid faces. In this group the mouth is usually closed. Ear symptoms are not common, and hearing is fairly normal. Morning cough and laryngobronchial symptoms predominate. The adenoid tissue is found on the pharyngeal walls, but the choanas are free. The author offers the term "nasal face," or the face of nasal obstruction, as expressing the essential idea better than adenoid face.

Adenoids in Adults.—W. Kent Hughes [1] quotes a series of cases of deafness in adults in whom he found remains of adenoids. The removal of this tissue caused improvement in the hearing. He believes that "once an adenoid, always an adenoid," as, even though diminished in size, it still remains a power for evil for all time. In the examination of these growths, which are usually smooth thickened areas, he finds digital examination with the palmar surface of the finger applied to the pharyngeal wall as high as the vault more satisfactory than when the finger is introduced with the nail toward the back of the throat. [While theoretically it seems probable, we doubt whether the vault of the pharynx can often be reached in that manner.]

Adenoids and Epilepsy.—Lennox Browne [2] described 2 cases of epilepsy apparently greatly ameliorated by the removal of adenoids and tonsils. One patient was a child who had very frequent epileptic attacks from the age of 4 years until the operation for adenoids 14 months later. The epileptic habit was so confirmed that the attacks continued for several weeks after the operation. The writer then suggested 3-grain doses of bromid, under which rapid improvement took place with a cessation of the attacks and marked physical and mental development, though much larger doses were ineffective previous to the operation.

Anesthesia for Children with Adenoids.—T. H. Halsted [3] believes that experience will demonstrate that chloroform is not the safe anesthetic for children, especially for those having adenoids, that it has generally been believed to be. He quotes Wyeth to the effect that while preferring chloroform in about 75% of his operations in general surgery, he considers chloroform especially dangerous in children under 12 years of age. Kolisco, who averaged 2000 autopsies annually for years, of which number 6 a year were on persons dying from cardiac syncope due to chloroform, and in whom no previous lesion of the lungs, kidney, or heart was known to exist, found always that the subjects had the "lymphatic habit"—viz., enlarged lymph-glands, persistent thymus, and adenoids. For simple adenoid operations the author prefers primary ether narcosis. When the tonsils also are to be removed, the third stage of anesthesia may be necessary. To check the exces-

[1] Intercolonial Med. Jour. of Australasia, Jan. 20, 1901.
[2] Jour. of Laryn., Rhin., and Otol., Dec., 1900.
[3] Phila. Med. Jour., Nov. 3, 1900.

sive secretion of mucus he gives atropin, gr. $\frac{1}{300}$ to gr. $\frac{1}{100}$, hypodermically before beginning the administration of ether. In a few cases the resulting dryness of the mucous membrane seemed to interfere with the expulsion of the blood and what mucus was secreted. He also finds that the patients are less liable to vomit if a few drops of 5% or 10% cocain solution are applied on a cotton swab to the nasal mucosa. With these precautions he finds ether as readily administered as chloroform, with but a fraction of the danger.

Ether Preceded by Nitrous Oxid.—Otto T. Freer, in a personal communication, reports satisfactory results in the use of ether preceded by the inhalation of nitrous oxid for anesthesia, especially in operations on the tonsils and adenoids. The quiet anesthesia obtained and the absence of alarming changes in breathing make these anesthetics decidedly superior to chloroform for these cases. He uses the ordinary dentists' apparatus for the gas and gives the ether from a common cone, as requiring less attention than the apparatus of Thomas L. Bennett or that of S. Ormond Goldan, which are more complicated, but enable one to give both gas and ether through the same face-mask. He found that the patients emerged more or less from the gas-anesthesia before coming under that of the ether, but the time until ether-narcosis was established was markedly shortened, and less ether was necessary.

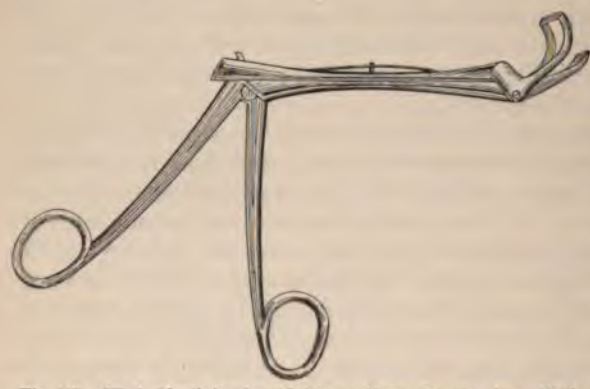


Fig. 117.—W. A. Martin's adenoid forceps (Laryngoscope, Aug., 1900).

Modified Adenoid Operation.—David McKeown,[1] observing occasional adhesions between the posterior wall of the pharynx and the eustachian prominences after adenoid operations, suggests avoiding the use of instruments in Rosenmüller's fossa and pressing out the lymphoid tissue with the finger, leaving the mucous membrane as nearly intact as possible. While admitting that this operation is not as thorough and may be followed by recurrence of the lymphoid tissue, he maintains that it is a lesser evil than the faulty cicatrization. [The cicatrization with adhesions is not a common result of the operation, while it is not often practicable to remove the lymphoid tissue with the finger.]

New Adenoid Forceps.—W. A. Martin [2] devised a cutting forceps (Fig. 117) with a blade to fit the cutting edge. The inventor claims that one size is sufficient for operating on children from 4 to 14 years old.

[1] Brit. Med. Jour., Sept. 8, 1900.

[2] Laryngoscope, Aug., 1900.

Hemorrhage from Adenoid Operation.—Arthur Ames Bliss [1] had the misfortune to learn too late that his patient, a boy aged 17, was a hemophiliac. The patient had never had severe bleeding previous to the operation, but was subject to extensive ecchymosis upon slight injuries and had had swellings of the joints, called rheumatic. An older brother had bled excessively from slight cuts, and one maternal uncle and cousin were well-marked cases of hemophilia. He straightened the septum by Allen's supralabial resection and removed the adenoids with forceps. The usual bleeding during the operation stopped with its completion. The following day rapid bleeding began from both the septum and nasopharynx. Packing controlled the hemorrhage, but the child died on the fourth day in spite of ergot, brandy, strychnin hypodermically, and the transfusion of normal salt solution. [We can report a fatal case of hemorrhage and nephritis seen in consultation following the removal of adenoids and one tonsil under chloroform-anesthesia. The operator, H. C. Hill, states that the patient was a poorly developed girl of 17. The removal of the right tonsil by the snare and Ingals' tonsil forceps was followed by marked bleeding. The adenoid was quite firm and located mostly on the right side. After removing 4 or 5 bites with the Löwenberg forceps the bleeding was so profuse that the operation was suspended and the operator controlled the bleeding with a tampon of gauze held in the nasopharynx with his finger. Later he packed the nasopharynx with a strip of gauze through the left naris, the right being occluded by a deflection of the septum. The packing was renewed on the second day and finally removed on the third. Urine obtained from the patient by the catheter on the second day showed acute nephritis. The blood-examination gave: red corpuscles, 2,270,000; white cells, 19,000; hemoglobin, 35%. The patient died in spite of the usual remedies, including normal salt solution.]

Accidents Attending Adenoid Operations.—C. R. Holmes and H. S. Garlick [2] each contribute a personal experience in breaking a Gottstein curet when operating on adenoids. The former writer was fortunate enough to engage the fragment of curet, consisting of the semicircular end of the instrument, with his finger and thus removing it from the child's nasopharynx. The other patient swallowed the broken piece, which passed through its alimentary canal in 3 days without discomfort.

Intranasal Treatment in Diseases of the Ear.—Peter McBride,[3] in considering the advisability of intranasal treatment as affecting progressive deafness, separates the sclerotic from the catarrhal cases. In the former class he thinks it questionable whether nasal operations are ever of benefit, while they may do harm. In the latter class he advises operations on gross nasal lesions causing nasal symptoms and the removal of adenoids, if present. From the frequent occurrence of obstructive nasal lesions without middle-ear disease the causative relation of the former to the latter cannot be assumed. However, in

[1] N. Y. Med. Jour., Sept. 8, 1900. [2] Laryngoscope, May, 1901.
[3] Brit. Med. Jour., Sept. 8, 1900.

certain persons there is a marked inclination toward catarrh of the upper respiratory tract, and in some of these cases there is a tendency to involve the middle ear.

Emphysema of the Eyelid Complicating Ethmoidal Disease.—Beaman Douglass [1] calls attention to the emphysema of the upper eyelid which occasionally follows forcible blowing of the nose after operations on the ethmoid. This complication he attributes to too free cureting, with destruction of the middle turbinate and injury of the lamina papyracea. To avoid this accident he recommends the alligator forceps or some kind of cutting forceps with a small blunt edge which is less liable to perforate, but will remove polyps and diseased membrane with equal facility. Another rule he offers is to cut away the ethmoid cells, working along the outer side of the middle turbinate as a guide, thus avoiding both the orbit and the brain-cavity.

Empyema of the Frontal Sinus.—E. Fletcher Ingals [2] describes the anatomy of the frontal sinuses with especial reference to the irregularities in their drainage into the nasal cavities. The symptoms of both acute and latent empyema are fully set forth, as well as the various means available for diagnosis. Four case-records illustrate the great variations met in this disease. In case 1 the patient gave a history of catarrhal trouble confined largely to one side, of 3 months' duration, worse in damp or chilly weather, and attended by pain across the bridge of the nose. The left middle turbinate was swollen, with purulent secretion coming from the middle meatus. Eighteen days' treatment with a spray of saturated solution of boric acid and the occasional insufflation of a 4% powder of cocain to reduce the swelling cured the patient. She had later occasional mild attacks of frontal sinusitis without suppuration. The second case had extended over 6 months, with frontal pain almost daily, beginning about 10 A. M., and lasting 3 or 4 hours. Ingals resected the anterior end of the middle turbinate, permitting free discharge from the frontal sinus, after which, under the use of mild antiseptic and astringent sprays for 10 weeks, the discharge diminished and became nearly all mucus. Two months later an old empyema of the antrum became active and the frontal discharge increased. He then made a permanent opening into the antrum and had the sprays continued by the patient. The patient improved gradually without further operative treatment until her recovery was complete in the fourth year of the disease. The third and only male patient in the series was treated by Ingals at intervals for 10 years for suppurative ethmoiditis with polyps and frontal sinus disease. Later the antrum became involved. The operative procedures were practically the same as in the preceding case, neither patient being willing to undergo a radical operation on the frontal sinus. On September 25, 1900, he injected into the sinus by the natural opening about a dram of 10% solution of **protargol** in warm water by means of a long silver nozle attached to a large hypodermic syringe. Although the opening was large enough to allow the solution to escape slowly, a

[1] N. Y. Med. Jour., Mar. 2, 1901. [2] Jour. Am. Med. Assoc., July 27, 1901.

severe headache followed, lasting all day. After 9 injections of 5% protargol within 35 days the discharge of mucopus almost entirely ceased. A few more injections of 3% protargol caused a cessation of all discharge. Three months later there had been no return of the suppuration. The fourth patient presented a marked supraorbital swelling and a history of catarrhal trouble of many years' duration, with severe supraorbital pain for the preceding 4 years. She had had polyps removed previously. The writer found no nasal discharge and advised an external opening, with free drainage into the nares. Dr. Bevan opened both sinuses by a continuous incision along the brow, disclosing a large cavity not divided by a septum, nor was there a posterior bony wall, the pulsations of the brain being visible. The cavity was packed with iodoform gauze and the wound closed, except at the root of the nose. A week later, under anesthesia, and with the little finger in the right naris, the writer passed a bent Krause trocar, 6 millimeters in diameter, from the lower portion of the frontal sinus into the right naris. Through this he introduced a rubber drainage-tube, funnel-shaped at the top, like that of Luc, and with a flange at the bottom. The tube had an internal diameter of $\frac{1}{8}$ inch. The patient washed out the cavity daily from the frontal opening, in which the writer placed a tube with a flange at each end. A year's treatment by washes and the insufflation of powders reduced the discharge to a small amount of mucus. The drainage-tube into the nose gradually worked up into the frontal sinus. Finally, a longer tube with a flange at the top and extending to the floor of the nose was worn 4 months longer. A wash of 5% protargol was used until the discharge became insignificant. The external opening was still maintained at the last report made by the patient.

Transillumination of the Antrum.—Lambert Lack [1] had a patient whose antrum was considerably distended by ordinary mucous polyps. The upper wall projected into the orbit, raising the eye to a higher level than the opposite eye, and the inner wall bulged into the nasal fossa. There was a polyp in the other nasal cavity, but no pus in the nose. Transillumination with a strong light showed both antrums equally translucent. The polyps were removed through a free opening in the canine fossa. Dundas Grant [2] thought it a very important addition to the knowledge of transillumination that a mass of polyps was translucent, because hitherto it had been generally believed that only a cyst could distend the antrum and at the same time be translucent.

The Tuning-fork in the Diagnosis of Antrum Disease.—D. A. Kuyk [3] offers a new method of assisting in the diagnosis of antrum disease. He found that the tuning-fork applied to the first or second upper molars is heard with equal distinctness and for a like duration over either side when the antrums are free and clear. If one antrum contains fluid the fork is heard less distinctly on the corresponding side. In one case in which transillumination showed the left side to be opaque

[1] Jour. of Laryn., Rhin., and Otol., Aug., 1900. [2] *Ibid.*
[3] Laryngoscope, Feb., 1901.

the fork was more resonant than on the right side. In this case the left antral wall was found to be thicker than the right, thereby favoring sound-transmission. The writer also found the same test satisfactory in a case of frontal sinus disease.

Etiology of Antrum Disease.—M. H. Cryer,[1] from the study of numerous anatomic specimens and from clinical experience, concludes that disease of the teeth has been given too prominent a place in the etiology of maxillary sinus disease. He even reverses the sequence generally heretofore accepted by dental surgeons, if not by rhinologists, and finds more cases in which the teeth are lost through disease of the antrum, than cases in which the teeth are primarily diseased. E. S. Talbot[2] strongly confirmed Cryer's opinion, as he found only 2% of his cases of antrum disease due to diseases of the teeth.

Opisthotonos Complicating Empyema of the Antrum.—Elmer Starr[3] reports a case of suppurating antrum which had been drained by the extraction of a tooth and drilling through the alveolar process. The drainage canal was kept open by passing a probe daily, but eventually the pain accompanying this procedure became so great that the patient neglected the treatment for 2 or 3 days at a time. Finally, after a 3 days' period, the patient passed the probe, and the resistance was so great that when the probe passed into the antrum the eye immediately protruded from the lids. The antrum was apparently full of gas under considerable pressure when the probe broke the floor of the orbit. The eyeball was soon pressed back into the orbit without permanent injury.

Primary Epithelioma of the Antrum.—H. Holbrook Curtis[4] reports a case of primary epithelioma of the left antrum occurring in a woman aged 50. Trephining through the alveolar border gave exit to a free bloody discharge with brown caseous material. The left naris soon became occluded and the pain was of a severe neuralgic nature, involving the distribution of the fifth and seventh nerves. Enlarging the opening, the writer freely cureted the entire antrum. The floor of the orbit was found as thin as tissue paper and the entire bone-wall was spongy. The cavity was daily irrigated with hydrogen peroxid and packed with iodoform gauze, the pain being controlled partly by large doses of morphin until death relieved the patient's suffering, in the sixth week after the cureting.

Dentigerous Cyst.—Frederic C. Cobb[5] notes the clear or chocolate-colored, serous character of the fluid contained in dentigerous cysts. To differentiate between these cysts and empyema of the antrum he first introduces a cannula through the anterior or lower wall of the tumor and washes out the cavity with water from a syringe, the water escaping around the cannula. Then he passes the cannula through the roof of the cyst, when the fluid is found to escape from the ostium maxillare into the nose.

Sinuses in the Sphenoidal Wings.—Beaman Douglass,[6] from

[1] Jour. Am. Med. Assoc., Nov. 24, 1900.
[2] *Ibid.*
[3] Buffalo Med. Jour., June, 1901.
[4] Laryngoscope, Oct., 1900.
[5] Laryngoscope, Dec., 1900.
[6] Laryngoscope, Feb., 1901.

an investigation of the pneumatic cavities of the sphenoid in 200 cases, found that only in 15.5% was the sinus limited to the body of the bone. In 84.5% of the cases the great sphenoidal sinus extended into the wing. In some cases the lesser wing was occupied by a sinus that communicated with the posterior ethmoidal cells. The practical bearing of these sinuses of the sphenoidal wings to the work of the rhinologist is that it is possible to have these cells diseased in empyema either of the ethmoidal or sphenoidal regions and the disease will persist in this sinus whether the ethmoidal cells in front or the great sphenoidal sinus be cureted and washed out with the cannula. On the other hand, if, when cureting the posterior ethmoidal cells, the instrument suddenly perforates a thin wall, the operator will think that he has opened either the brain-cavity or the great sphenoidal cavity unless he knows the existence of the sinus of the sphenoidal wings. In some cases this may be an easier method of draining the sphenoidal sinus than the usual operation near the normal opening.

A Superimposed Uvula.—Thomas Amory DeBlois [1] reports the case of a young man whose throat presented the appearance represented in figure 118. The writer removed the extra uvula with the cautery snare, when the normal uvula fell back into the median line. The one removed was composed of normal muscular tissue and was attached to an extra fold of the posterior pillar. The writer considers the case exceptional on account of the position of the abnormal uvula behind the normal organ.

Fig. 118.—Superimposed uvula (DeBlois, in N. Y. Med. Jour., Dec. 22, 1900).

Adhesion of the Soft Palate and Pharynx.—Augustus Koenig [2] describes an operation on an adult for the relief of a vicious adhesion between the soft palate and the posterior wall of the pharynx, resulting from an ulcerated sore throat at the age of 11 years. The original adhesion had completely occluded the posterior nares and was followed by total loss of hearing. The hearing had been improved by a previous attempt to open the obstruction. At the time of the writer's operation the opening would barely admit a retractor. Nasal breathing was almost entirely abolished. The pharynx was atrophied, dry, and shining. The patient was thin, anemic, and easily fatigued. Under 5% cocain thoroughly applied the adhesion was partly separated with curved scissors and the operation was completed by a special instrument having the general curve of a Gottstein curet, but having a double lateral cutting edge. An antiseptic plug was worn 48 hours, after which a special hollow silver plug was worn to prevent contraction during healing, which was complete in 3 weeks. There has been no return of the trouble in 20 months. [We would suggest introducing a thread through

[1] N. Y. Med. Jour., Dec. 22, 1900. [2] Phila. Med. Jour., Feb. 16, 1901.

the highest point of the adhesion, to be worn until a permanent opening results, then cutting the bridge of tissue with curved scissors.]

Chancre of the Tonsil.—John Edwin Rhodes,[1] from a study of 4 cases of chancre of the tonsil from his own practice and 31 unreported cases contributed by 18 writers, concludes as follows: (1) Chancre of the tonsil is often unrecognized because its early symptoms differ but little from those of ordinary sore throat. (2) An enlarged tonsil with a superficial ulcer upon its surface, accompanied by enlargement and induration of the contiguous submaxillary gland, and which is unchanged by a prolonged course of treatment, renders a diagnosis of chancre probable. (3) The character of the chancre depends upon the original condition of the tonsil as to size, density, the amount of follicular inflammation, and the coincidence of a mixed infection. (4) A certain diagnosis cannot usually be made until the general eruption of the disease. (5) The explosion of the disease is no more severe than in chancre elsewhere. (6) The disease is contracted by direct contact or by various media carrying the virus. (7) When we consider the frightful contagiousness of syphilis and the frequency with which it is conveyed to innocent persons, the most careful use of instruments for the throat and nose, dental and other surgical instruments, clinical thermometers, etc., is necessary. (8) Separate instruments should be used for the examination and treatment of known syphilitics, but the possibility of contamination before the existence of lues has been recognized makes it imperative that every operator should employ a rapid and efficient disinfection or sterilization of instruments after the examination or treatment of every patient.

Peritonsillar Abscess.—F. C. Cobb[2] attributes peritonsillar abscess to infection by the germs of acute tonsillitis, with development in the cellular tissue above, behind, or in front of the tonsil. Injection of the pharyngomaxillary space bounded by the tonsil, the internal pterygoid muscle, and the palatine arches, gives an appearance similar to peritonsillar abscess. This space is separated into an anterior and a posterior portion by the staphylopharyngeus muscle and its fascia. Pus forming in the anterior space thus pushes forward and inward until it makes its exit through the pillars, usually in front of or behind the tonsil. Cobb thinks it impossible to abort the inflammation after swelling has appeared. The remedies recommended, salicylates, aconite, etc., he finds depressing and contributing to the exhaustion caused by the disease. Frequent gargles of hot water tend to bring the abscess to a head. On the third or fourth day he incises under cocain at the point where fluctuation is detected in either pillar or dissects the tonsil away from the anterior pillar, giving exit to the pus; or careful incision in the supratonsillar fossa, not passing behind the plane of the posterior pillar, is sometimes effective. Deep incision in the anterior pillar will not remain open unless the inflammation has matted the tissues together, on account of the superficial and deep layers of muscles crossing at right angles. [The application by spray of 50% guaiacol in oil of sweet

[1] Tr. Am. Laryn. Assoc., 1901. [2] Boston M. and S. Jour., Feb., 1901.

almonds 2 or 3 times will in the majority of cases abort acute inflammation in the region of the tonsils, many of which would develop into peritonsillar abscess.]

Hemorrhage from Peritonsillar Abscess.—W. F. Chappell [1] reviews from the literature 10 cases of severe hemorrhage occurring in peritonsillar abscesses that ruptured spontaneously. There was a fatal termination in 8. In his case he made an incision in the posterior pillar, giving exit to about an ounce of pus. After improving for 4 days the patient complained of pain followed by a hemorrhage which ceased on the application of tannin to the abscess-cavity. The urine was found to be loaded with albumin, epithelial cells, and granular casts. On the ninth day after the operation another hemorrhage occurred, after which the writer incised the soft palate freely back to the abscess-cavity. The ascending pharyngeal artery was exposed in the outer and back wall of the cavity. The wound was packed daily with iodoform gauze for 10 days, when it was healed. During the treatment the patient had a rheumatic attack, with severe pain in muscles of the legs and in the abdomen. The writer attributed the rheumatism as well as the nephritis to the tonsillar abscess. His conclusion is that early free incision would probably have prevented the extensive necrosis and the consequent severe or fatal bleeding. When hemorrhage occurs, immediate ligation of the carotid should be performed, or, as in his case, a free incision through the anterior wall with firm packing of the abscess-cavity.

Rheumatic Fever in Relation to the Throat.—St. Clair Thomson [2] formulates the present state of our knowledge of the relation of tonsillar affections to rheumatism as follows: (1) It is undoubted that a certain number of cases of acute rheumatism are preceded by an angina in proportions varying from 30% to 80%. (2) Both rheumatism and angina have many etiologic points in common: the season, cold, wet, fatigue, depression, vitiated air, etc. (3) The connection of angina and rheumatism, though undoubted in a number of cases, is not yet clearly established. (4) The tonsil may be the port of entry of the rheumatic virus, and this even though the naked-eye appearance of the throat gives no indication of its being affected. (5) The particular affection of the throat which is associated with rheumatism is not yet established. Apparently it is not peritonsillar abscess. (6) Peritonsillar inflammation does not appear to be arrested by the administration of antirheumatic remedies. Many cases of parenchymatous and lacunar tonsillitis, on the contrary, are considerably benefited by the administration of salicin or sodium salicylate. That this proves the rheumatic nature of the disease cannot yet be accepted. (7) The question requires further research in two directions, one in differentiating the various forms of angina, and determining the one which is associated with rheumatism; the other in further research to discover the true nature of rheumatism.

Membranous Sore Throat.—Emil Mayer [3] quotes 5 cases of so-

[1] N. Y. Med. Jour., Mar. 2, 1901. [2] Practitioner, Jan., 1901.
[3] N. Y. Med. Jour., Dec. 22, 1900.

called recrudescing angina in which Friedländer's bacillus was found in the membranous exudate, and adds a description of another case. The patient was a woman, aged 25, who for 18 months past had not been free from false membrane more than 14 days in succession. Usually only 2 or 3 days intervened between the disappearance of one membrane and the development of a new one. She was anemic and subject to acne rosacea, but was tall and well developed. The formation of the membrane is associated with a sensation of tightness in the pharynx. The soft palate becomes opaque-looking, and a very thin, adherent, and non-transparent membrane may be seen. Scattered through it are numerous very small blebs. It is impossible to remove the membrane at this time. In a few hours it becomes thick and pearly white. The suffering is great at this stage, and the patient has learned to give herself relief by sticking the point of a pair of scissors into it and gashing it. The pain thus relieved, all actual discomfort ends. Exfoliation now occurs, and large pieces may be removed without pain, the underlying mucous membrane being reddened, but not bleeding. Mayer's conclusions are: (1) Anginas due to the bacillus of Friedländer may exist in a subacute or chronic form. (2) They occasion no distress, except perhaps in the beginning of the membranous deposit. (3) They may appear in membranous form, exfoliating and recurring. (4) In the chronic form treatment seems to be of no avail, the bacilli eventually becoming much less active, and the condition ceases by limitation. (5) They are probably much more frequent than the few recorded cases seem to indicate. [We can add the case of an otherwise healthy bartender, aged 37, whose palate, pharynx, and nasopharynx were the seat of a similar membrane, which formed at intervals for several months and periodically peeled off in large sheets. In this case the bacteriologic examination was made by the pathologist of the Chicago Board of Health.]

The Lingual Tonsil. — Robert Levy [1] classifies the prominent symptoms of enlargement of the glands at the base of the tongue into: (1) Simple discomfort. Often the sensation is that of a foreign body and is referred to the lower pharynx. The patient often says this symptom follows the swallowing of a foreign body or the lodgment of a poorly masticated piece of food. (2) Severe cough, as in incipient tuberculosis. This is the most common symptom of enlarged glands. (3) Vocal distress, usually occurring in singers. Vocal fatigue is easily induced, with inability to produce notes of pure quality. (4) Suffocative attacks occurring at night or brought on by attempts to swallow large boluses of food. (5) Dysphagia varying from slight discomfort in swallowing to serious impairment of nutrition. (6) Hemorrhagic cases. While many of the symptoms of hypertrophy may be due to enlarged veins, bleeding is not a common occurrence in the writer's experience. Cases of lingual tonsil may require constitutional treatment for dyscrasias, but locally the galvanocautery is the remedy *par excellence*. [In our observation cough is not a common nor prominent symptom.]

[1] N. Y. Med. Jour., Sept. 15, 1900.

Lingual Tonsil Scissors.—J. H. Morrison,[1] finding it impossible to remove certain lingual tonsils with the Bosworth snare on account of the tough, fibrous nature of the pedicles, devised the scissors (Fig. 119) to complete the removal of the mass when the snare could neither complete the removal nor be disengaged. In favorable cases the scissors may be used without the snare. He calls the scissors a combination of the Asch septum-forceps and the common curved uvula scissors.

Fig. 119.—Morrison's lingual tonsil scissors.

A Portable Atomizer.—George F. Cott[2] devised an atomizer and air compressor (Fig. 120) which he claims will hold air under pressure indefinitely, one pumping being sufficient to exhaust the half-ounce bottle of medicated solution. It can be carried in a small handbag with a half-dozen bottles of different solutions.

Fig. 120.—Cott's portable atomizer (Jour. Am. Med. Assoc., Nov. 3, 1900).

The Upright Position in Ether-operations upon the Nose, Throat, and Ear.—Thomas R. French[3] recommends the upright position in ether-operations upon the nose, throat, and ear for the following reasons: (1) The very considerable reduction in the amount of blood lost; (2) the reduction of the chances of complications in the ear, by securing complete drainage of the nasopharynx of blood; (3) the ease, thoroughness, and accuracy with which operations can be done in

[1] Med. Rec., July 21, 1900. [2] Jour. Am. Med. Assoc., Nov. 3, 1900.
[3] N. Y. Med. Jour., Oct. 13, 1900.

the shortest time, by the retention of the usual relationship between operator and patient. The writer devised a metal chair (Fig. 121) with

Fig. 121.—French's chair for anesthesia.

legs of bicycle tubing, into which the supports of the back telescope, to make the head-rest fit the patient. The child is anesthetized and bound to the chair as in the illustration, and is then raised to the upright position, facing the surgeon during the operation.

Fig. 122.—Freer's intratracheal spray.

A New Intratracheal Spray.—Otto T. Freer [1] devised a spray tube (Fig. 122) for use in chronic tracheitis, especially the dry form with crusts. The appliance screws on the regular Davidson atomizer with nasal tip, and its end can easily be passed between the vocal cords, by aid of the mirror. In sensitive larynxes slight local anesthesia is needed. The instrument emits a coarse spray within the trachea. Certain cases require a tube of extra length.

How to Prevent Stammering.—G. Hudson Makuen [2] points out that stammering is not generally of sudden onset, but is of slow devel-

[1] Jour. Am. Med. Assoc., Feb. 16, 1901. [2] Phila. Med. Jour., Mar. 30, 1901.

opment and begins during a period of great excitement. Thus, the child attempts to describe an incident that seems to him of vast importance. Various details of the incident become confused in his mind and he cannot select the proper words and enunciate them as rapidly as seems to him necessary. His excitement increases his heart's action and breathing and they become inadequate to the requirements of normal speech. The result is a repetition of the initial sound or syllable of some word. This is stuttering, the prodrome of stammering; and it is at this stage that treatment should begin. The child's excitement should be calmed by diverting his mind from the subject in hand until he has regained his mental equilibrium, and then he should be led back gradually to the main subject and given a clear conception of exactly what it is he desires to say and shown how to say it deliberately and clearly. Thus careful management at the beginning of the difficulty will almost surely prevent the habit of stammering. Curing the habit after it is established is not only more difficult, but it is much more complicated.

Chronic Spasm of the Palate, Pharynx, and Larynx.—Felix Semon [1] reported the case of a married woman who complained of clicking noises in her head and curious darting movements in her abdomen, as if there were something alive and passed from the stomach into the throat, head, back, and limbs with great rapidity. In October, 1899, she first noticed the clicking noise in her throat, and it has continued ever since, but it apparently bears no relation to the stomach movements. The patient is well nourished, stands or lies with her head thrown well back, the chin and neck thrust forward and the mouth kept slightly open. There is a constant slight clicking sound occurring about 4 times per second on the average, audible when she speaks, between the words, but ceasing during sleep. On inspection the sound is seen to be produced by vertical movements of the soft palate associated with similar movements of the floor of the mouth. The arytenoids and vocal cords also move rhythmically from side to side during respiration. Phonation is normal. Semon concludes that speculation as to the exact location of the focus of irritation causing the spasm is at present idle. [We have seen a similar case in which the clicking seemed to be produced in the nasopharynx.]

Laryngeal Whistling.—Felix Semon [2] describes a case of voluntary laryngeal whistling by a boy aged 13. When making the sound the epiglottis is seen to be forcibly drawn downward, but enough of the cords can be seen to show that the arytenoids must remain 1.5 to 2 millimeters apart from each other. The writer could not account for the formation of the sound with the glottis so open, though it was apparently formed in the larynx. Waggett [3] suggested that the boy might have some structure resembling the syrinx of a bird. The notes were bird-like.

Singer's Nodules.—Capart [4] thinks the ordinary treatment of

[1] Jour. of Laryn., Rhin., and Otol., Mar., 1901.
[2] Jour. of Laryn., Rhin., and Otol., July, 1900.
[3] *Ibid.*
[4] Ann. of Otol., Rhin., and Laryn., Aug., 1900.

singer's nodules by rest and spraying with astringents and such mild cauterization as silver nitrate entirely inefficient. In all cases he prefers the complete destruction of the nodule either by delicate cutting forceps or by the galvanocautery. The latter is reserved for growths too small to be grasped by the forceps. After operation silence should be enjoined for some time and singing is to be avoided for at least a month. A change of method, register, or teacher may be necessary. [H. Holbrook Curtis [1] claims that singer's nodes can be readily cured without operation by a simple change in the method of singing.]

Laryngeal Stenosis.—Emil Mayer [2] describes a unique case of stenosis of the larynx caused by a Mauser bullet wound received by a soldier at El Caney. The bullet entered the right frontal bone near the median line, passed downward and backward through the superior maxilla, cut through the posterior portion of the soft palate, and entered the neck. Deflected probably by the hyoid bone, it then entered and comminuted the thyroid cartilage, cut into the esophageal wall, and dropped into the stomach, being later voided. The patient was tracheotomized for severe dyspnea before coming under Mayer's care. To overcome the stenosis he gradually dilated it with Schrötter and O'Dwyer tubes until an adult size was used. The latter was kept in place 6 weeks by making a threaded opening in it opposite the tracheal opening and screwing the solid tube into it. Not being able to swallow, he fed himself by means of an esophageal tube. Ten days after its removal dyspnea again made the tracheotomy-tube necessary. Dilation with Schrötter's tube was again done daily for months, the patient wearing the tracheotomy tube between the treatments. Finally the writer devised a tube with a head as low as possible to permit deglutition, no retaining swell, a threaded opening for a screw-piece, and finally a hollow introducer, which simplified the intubation very materially. The patient's condition was so improved that the writer expected the new apparatus would complete the cure. I. A. Abt [3] attempted unsuccessfully to intubate a girl aged 13 months for dyspnea of 2 days' duration. Tracheotomy was followed by death in 24 hours. The autopsy showed the fauces free from false membrane, but the lumen of the larynx was greatly diminished by a white adherent membrane. Bacteriologic examination disclosed staphylococci and diplococci which were identified by W. J. Class as Diplococcus scarlatinæ.

An Intubation with Complications.—Joseph Mullen [4] intubated a child of 2 years suffering from diphtheric laryngitis without difficulty. Five days later an unsuccessful attempt was made to extubate, the larynx and base of the tongue being lifted up with the tube during the attempt. The attempt was repeated weekly for 6 weeks, without success. At this time, 3 weeks after the child's recovery from diphtheria, it had symptoms of the grip and extubation became imperative. Mullen then opened the cricothyroid membrane without discovering the tube.

[1] Voice Building and Tone Placing, 1896.
[2] Jour. Am. Med Assoc., Oct. 27, 1900.
[3] Practitioner, Mar., 1901.
[4] Laryngoscope, June, 1901.

The operation was extended to a laryngotracheotomy, and still no tube was to be seen. With reflected light a long, round ridge of granulation-tissue was seen extending upward into the larynx and downward into the trachea. After this tissue was scraped away, the gold-plated tube appeared, as black as vulcanized rubber. The tube was grasped with forceps and pushed up into the mouth, the index and middle fingers of the left hand pressing down upon the larynx, practically stripping it from the tube. Six hours later the child developed a catarrhal pneumonia, from which she made a slow recovery. At present her voice is very much impaired in tone and volume, but it is gradually returning to normal.

A New Instrument for Subglottic Growths.—Robert C. Myles [1] devised a new instrument (Fig. 123) for the removal of subglottic papillomatous growths. The instrument consists of a handle with finger-ratchet, extension Schrötter tube, and a revolving, unilateral forceps. Its mechanism is similar to that of Dundas Grant's forceps.

Fig. 123.—Myles' instrument for the removal of subglottic growths (Med. News, Mar. 16, 1901).

The Prognosis of Laryngeal Tuberculosis.—Jonathan Wright [2] expresses his conviction that the permanent radical cure of the local lesion of tuberculous laryngitis is not materially hastened by the various methods of treatment in more than an insignificant number of cases. Cicatrization of the ulcers or partial absorption of the infiltration may occur at one place while more extensive involvement may take place elsewhere, perhaps where it ceases to cause pain, as below the cords or deep in the tissues, or where it cannot be seen, as in the ventricles. The writer therefore advocates climatic change as the most effective agent in the cure of this disease.

The Diagnosis and Treatment of Cancer of the Larynx.—John N. Mackenzie [3] makes a plea for greater reliance on inspection of the growth intralaryngeally, and if necessary assisted by thyrotomy for the diagnosis of cancer of the larynx. Removal of a portion of the growth

[1] Med. News, Mar. 16, 1901. [2] Med. News, Jan. 19, 1901.
[3] N. Y. Med. Jour., Sept. 8, 1900.

for microscopic examination he condemns as favoring autoinfection, causing rapid increase in the growth, and as being often misleading. Before resorting to thyrotomy, especially if a portion of the growth is to be removed for examination, he would obtain the patient's consent to immediate operation if that seemed advisable to the surgeon. As no refinement of diagnosis can determine the exact extent of the cancerous growth, especially in diffuse infiltration, Mackenzie relegates to the limbo of ancient surgery all the refinements of intralaryngeal operations, as well as all partial removals of the larynx for cancer. The dangers of extirpation of the larynx are largely, if not wholly, preventable. Excision of the larynx and removal of the neck lymphatics is one of the simplest and easiest dissections of major surgery, and the chief danger of the former, septic pneumonia, may be perfectly done away with by a low tracheotomy and packing between the tube and the upper wound. The chief danger is not from the operation, but from recurrence in the neck lymphatics. Total removal of the larynx with the neighboring lymphatic area before the latter is obviously too much involved is then the only procedure that promises a better prognosis or fulfils the surgeon's duty to the patient. Felix Semon [1] considers malignant neoplasms strictly limited to the interior of the larynx as at present the most important indication for **thyrotomy.** He thinks there ought always to be some proportion between the degree of the disease and the operative measures undertaken to cure it. Ernest Waggett,[2] discussing the relative merits of **thyrotomy and laryngectomy** for malignant disease of the larynx, quotes Sendziak's tables, including all available cases operated on between 1851 and 1894, as follows:

	Number of Cases.	Deaths from Operation.	Recurrence.	Good Results—Free from Recurrence at End of 1 Year.	Cures—Free from Recurrence at End of 3 Years.
Total extirpation . . .	188	44.7%	32.4%	12.8%	5.85%
Thyrotomy .	85	9.8%	53.3%	13%	8.7%

Thus the results of thyrotomy were better during the whole period. Since 1888 the improvements in thyrotomy have increased the definite 3-year cures to 29.9%. In addition to the vastly greater mortality of laryngectomy with its smaller percentage of cures, one should consider the miserable condition of the patients who survive such a mutilation. The writer asserts that at least 4 patients who survived the operation have exemplified their views by committing suicide. D. Bryson Delavan,[3] reviewing all the available statistics of operations for cancer of the larynx, finds that they are all more or less deceptive, owing to the general failure of surgeons to report their unfavorable cases or to keep the cases under observation long enough to report the recurrences. To

[1] Lancet, Aug. 11, 1900. [2] N. Y. Med. Jour., Mar. 9, 1901.
[3] N. Y. Med. Jour., Sept. 15, 1900.

put the whole subject of operative interference on a scientific basis, the writer suggests that the most successful and experienced operators systematize their efforts, perfect their appliances and methods, and keep accurate records of everything pertaining to the history of the work. Then in time it will be learned whether radical extirpation of laryngeal epithelioma is a justifiable procedure, or whether, as seems to the writer probable, the practical necessities of these cases must be met by means less hazardous to the life and comfort of the patient and more certain of complete and lasting success. Joseph S. Gibb [1] attributes the death of his patient 5 days after **laryngectomy** for carcinoma to a septic condition induced by the removal of portions of the growth some months before for relief of the dyspnea and for microscopic examination. He was also impressed by the necessity for a preliminary tracheotomy to cause fixation of the larynx, to prevent the tugging of the trachea after the laryngectomy. [It should not be forgotten that tracheotomy to relieve the urgent symptoms of malignant disease of the larynx frequently prolongs life 1 to 3 or more years, and there are many laryngologists who believe that the average duration of life after tracheotomy for malignant growths is much longer than after laryngectomy.]

[1] Laryngoscope, Oct., 1900.

ANATOMY.

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BONES AND JOINTS.

The similarity between the **red and fetal marrow** of bones is confirmed by Hamann.[1] As stated by him the fetal medulla passes through two well-defined stages, the first of which is characterized by a vascular embryonic connective tissue, with branching and anastomosing cells, of a stellate and fusiform shape. Leukocytes during this stage are notably absent. Not until the fourth month does the invasion of the white cells take place, in the long bones beginning at about the middiaphyseal point. Their round shape and small, dark, and frequently fragmented nucleus form a marked contrast to the fixed cellular elements. As ossification progresses the leukocytes increase numerically and now lend to the medulla the appearance of lymphoid tissue. In certain parts the accumulation of leukocytes around the vessels constitutes the distinct point in the field of vision. Marrow, as seen by the foregoing, passes through the same developmental changes as other lymphoid tissue—that is, is preformed as connective tissue, subsequently to be invaded by leukocytes. For the connective-tissue stage the name of primary bone marrow is proposed, and as red marrow forms but a transitory stage to its yellow confrere, three developmental stages (primary, red, and yellow) are ascribed to the marrow of the bone.

Atrophy of Bone.—Suduk,[2] by means of the x-ray, established the fact that atrophy of bone normally results both during their functional inactivity and in old age. The lesser density of bone as shown by the rays becomes a marked feature in old age, and is also well illustrated in arthritis deformans, and coxa vara senium. In the former, exostoses subsequently occur from functional irritations or lesions, and deformities appear owing to the pressure of the body weight and proliferations of synovial fringes. Atrophy due to inactivity becomes apparent in a relatively short time,—6 to 8 weeks,—as could be seen in several cases of leg fractures, in which the bones of the foot visibly lost in substance.

Rothschild draws a sharp **distinction between the angulus Ludo-**

[1] Anat. Anz., 1901, Bd. XIX, No. 22, 567.
[2] Fortschritte auf dem Gebiete der Röntgenstrahlen, Bd. III, H. 6.

vici and sternal angle. Both of these occur at the junction of the corpus sterni and manubrium, but are, however, not identical. The former has for its causative factor the thickening of the anterior border of the intervening joint, which especially in tuberculous subjects acquires a still greater prominence from exostoses. The sternal angle, the normal angle at the junction of the pre- and mesosternum, in a series of measurements with a specially constructed sternogoniometer, was found to be variable not only sexually, but also during the respiratory phases. In males, during quiet respiration, the sternal angle averages 167.15 degrees. Deep expiration increased this about 5 degrees, while during deep inspiration a decrease of about 9 degrees was noted. The less marked difference in women during in- and expiration is accounted for by the greater mobility of the upper ribs. Up to about 60 years of age articular mobility between the two component parts of the joint is said to exist, synostosis occurring at about this time. In tuberculous subjects the sternal angle approaches a straight line.

Supernumerary Cervical Vertebra.—The skeleton of a full-time hydrocephalic fetus which Paterson [1] exhibited before the Anatomical Society of Great Britain and Ireland presented the rare anomalous condition of an eighth cervical vertebra with two cervical ribs. On the right side the body of the cervical rib continued into that of the succeeding one, while on the left side its extremity remained free from any attachments. The presternum on the left side bore a tapering cartilaginous horn, the probable representative of the first costal cartilage.

Cranial Sutures.—Adermann,[2] in a series of 2554 craniums (5108 temporal bones) examined, noticed the presence of the fissura mastoide asquamosa in 1860 of these. In 64 this suture was very prominent, in 1854 it was clearly discernible, while in 951 craniums but a faint trace of such a suture existed.

Frasetto [3] attempts to subordinate the **origin of the cranial sutures** to a definite law of two ossification centers, viz., that for the development of each suture two centers of ossification are essential. In accordance with this law the existence of four centers in the parietal bones of man and certain monkeys (cercopithecus orang-outang) is thought to be probable.

Turner [4] reports an additional case of **double unilateral parietal bone.** In the skull of a Scotchman a strongly denticulated suture extending from the coronal to the lamboid suture divided the left parietal bone into two unequal portions, of which the upper moiety was the larger. This interparietal suture extended through both external and internal tables, but was less marked in the latter. At its anterior end two small sutural bones were interposed between it and the coronal suture, a slight depression also existing at this point. Bilateral epipteric bones and a left parcondyloid process were the other noteworthy and abnormal features in this skull, otherwise of normal ossification.

[1] Jour. Anat. and Phys., vol. XXXV, part III.
[2] Zeit. f. Ohrenh., Bd. XXXVII, S. 358.
[3] Anat. Anz., Bd. XVIII, S. 61.
[4] Jour. Anat. and Phys., vol. XXXV, part IV, p. 496, July, 1901.

Accessory Sinuses of Nose.—Onodi's [1] studies on 20 craniums disclose the somewhat variable interrelationship of the different accessory sinuses of the nose. Extension by means of prolongations may bring the maxillary and sphenoidal sinuses into such close proximity that but a thin osseous wall separates them. With the posterior ethmoidal cells and the antrum a similar condition is not precluded, while with the anterior ethmoidal cells it may even eventually communicate. The frontal sinus and ethmoidal cells, both anterior and posterior, by extending between the lamella of the orbital roof, may also come in contact by direct continuity. The practical deductions derived from these anatomic variations center for the most part around the sequels of purulent effusions into these sinuses.

Symphysis Pubis.—With the view of determining a number of alleged facts in regard to the cavity in the fibrocartilage of the symphysis pubis, Zulauf [2] examined the structure in 57 males and 50 females. The statement that such a cavity is of constant occurrence could be verified neither in adults nor in children. In the female sex, and especially in pregnant women, its size easily exceeds that in the male. While in the great majority of cases the cavity was dry, having for its contents broken-down remnants of fibrocartilaginous tissue, in some a thin fluid and fatty masses were found. Liquefaction and fatty degeneration of intermediate portions of the cartilage are thought to give rise to its formation as well as its subsequent development.

Synovial Membrane.—Bronchi, [3] after examining the synovial membrane of fresh joints, confirms, as to the character of its cells (flattened connective tissue, not endothelial or epithelial cells), the findings of recent investigations. The histochemic research in staining with various iodin compounds revealed almost identical reactions for synovia and the ground substance of the cartilage, while no similarity between the former and synovial membrane was noted. From these results it is thought that the synovial fluid is derived from the degenerating ground substance of articular cartilage, and is expressed from the same during the movements of the joints. The synovial cells which are constantly being thrown off take no part in the formation of this fluid.

MUSCLES.

Cricothyroid Muscle.—Jurasz [4] proposes for the musc. cricoithyreoideus the name of musc. thyreocricoideus, as this term more definitely accords with its true function. The view is taken that this muscle serves only to approximate the cricoid with the thyroid cartilage, action in the opposite direction being denied. The absence of extrinsic muscular attachments of the cricoid cartilage implies a lack of a sufficient amount of fixation necessary for the approximation of the thyroid to the cricoid cartilage.

[1] Arch. f. Laryn. u. Rhin., Bd. XI, H. 3.
[2] Arch. f. Anat. u. Phys., 1901, p. 213.
[3] Lo Sperimentale, 1901, No. 2.
[4] Arch. f. Laryn. u. Rhin., Bd. XII, H. 1.

Pectoralis Major.—Lewis,[1] commenting on the axillary twist of the pectoralis major muscle and the various statements of anatomists concerning it, asserts that many of these are incorrect. In his dissections he found the muscle consisting of a variable number of overlapping bundles with a fan-like disposition, of which the clavicular and upper fasciculi formed the anterior layer of its tendon of insertion, while the lower bundles continued into the posterior layer. In these muscular bundles no crossing of fibers was evident, the lowest fibers continuing in a corresponding relation into the tendon, but overlapped the uppermost fibers of the succeeding fasciculus. Embryologic studies lead to the conclusion that in the downward migration of this muscle the superficial fibers descend further than the deeper, owing either to the great amount of friction against the chest-wall or to the earlier attachment of the latter and so gives rise to the overlapping of its bundles.

Trapezius.—Absence of the lower portion of the trapezius is assigned by Kaush [2] as one of the etiologic factors of congenital high scapula. In the cases observed this muscular defect was noted and thought to be the primary causative factor, as neither secondary acquirement nor an accompanying coincidence was thought to be probable. The fact that the lower portion of the muscle normally aids in pulling the scapula downward also seems to strengthen this view.

Levator Claviculæ.—The recognition of the omotrachelian muscle (levator claviculæ) in the living subject, a somewhat unique occurrence, is reported by Corner.[3] This anomaly, which was demonstrated by means of faradization, was present in the left side of a woman 28 years of age and constituted the only ascertainable maldevelopment in her family. Its origin was determined to be the transverse process of the atlas and probably also the axis, its insertion the outer end of the clavicle posteriorly.

Peroneus Tertius.—Jamieson,[4] from a dissection of 45 bodies, ascertained that the normal origin of the peroneus tertius from the anterior part of the internal fibular surface is subject to variations—*i. e.*, as to the extent of its origin. In 29 cases the origin extended from ½ to 2 inches above the midpoint of the shaft to within an inch of the external malleolus, in 6 cases it reached as far as the middle, while in 9 cases it arose from the lower third only. Absence of the muscle was noted in but 1 case. The origin from the anterior peroneal septum also extends upward from the body origin for a variable distance (1 to 2 inches); that from the interosseous membrane extends downward for about 1 inch. These lost fibers are usually closely associated with the extensor longus pollicis. The separation of the fibers of the peroneus tertius from the extensor longus digitorum is stated to be artificial, but very easy.

[1] Johns Hopkins Hosp. Bull., vol. XII, Nos. 121-122, 123, p. 172.
[2] Centralbl. f. Chir., No. 22, 1901, S. 564.
[3] Jour. Anat. and Phys., vol. XXXV, part II, p. 41, 1901.
[4] Jour. Anat. and Phys., vol. XXXVI, part I, p. 24, 1901.

HEART AND ARTERIES.

Cardioptosis.—DeLuca [1] seeks in the congenital defect of the suspensory mechanism of the heart the cause of essential cardioptosis. Insufficiency of the elastic tissue of the large vessels from developmental aberrations gives rise to a lack of resistance, which principally accounts for the failure of the suspensory apparatus to maintain it in its proper position.

Congenital malformation of the heart, implying a functional inactivity of the left ventricle, absence of the spleen and hepatic section of the inferior vena cava, a train of conditions which seemingly should render life inert, constitutes the peculiar case which Lawrence and Nabarro [2] place on record. In a child aged 14 weeks, but which had been cyanotic during the brief period of its existence, the necropsy revealed the total absence of the left auriculoventricular opening, a small but potential left ventricular cavity, dilated right ventricle, and an intraventricular foramen, also the absence of spleen and hepatic section of the inferior vena cava. The left ventricular cavity, which, as is stated, could easily have been overlooked, consisted of a narrow cleft-like space, lined by endocardium, and during life had probably been obliterated by the apposition of the interventricular septum to its own wall. The columnæ carnæ were of a rudimentary character, and the ventricular walls were considerably thinner than those of the right ventricle. The aorta, which arose in a manner from both ventricles, from the right of the intervention of the interventricular foramen, received its total quota of blood from the right ventricular cavity. The left auricle, when exposed to view, had on its interior a depression at the site of the normal auriculoventricular foramen. From the nodules and fibrous thickening of the pulmonary and tricuspid valves an inflammatory process causing atresia is held to account for the absence of this foramen.

Ductus Botalli.—Sharfe [3] denies the existence of a valve in the ductus Botalli at its termination into the aorta, and regards the same as an artifact. From a mechanical standpoint a valve at this end is altogether useless; not so at the pulmonary junction, as during the first respirations the pulmonary stream may be diverted into the aortic channel. The nonelasticity of the walls of this duct, together with other factors, serves as a prevention of such an occurrence. Displacement of the heart during the first respirations is said to be too inconstant and cannot be regarded as assisting in the closure of this duct. Intrauterine death is often due to premature closure of this duct from luetic endarteritis.

Open Foramen Ovale.—Blanchford,[4] in an examination of 700 persons, established the frequency of an opening between the right and

[1] La Riforma Med., 1901, Nos. 157, 158.
[2] Jour. Anat. and Phys., vol. XXXVI, part I, p. 63, 1901.
[3] Beitr. z. Geburtsh. u. Gynäk., Bd. III, S. 368.
[4] Jour. Anat. and Phys., vol. XXXVI, p. 36, 1901.

the left auricle, at the seat of the fetal foramen ovale, to be about 30 %. In women its occurrence is thought to be 5 % higher than in men. The diameter of this opening, which in the great majority of cases was single, varied from 1 to 15 millimeters.

Postnatal patulency of the ductus arteriosus for a period of at least 10 days is, according to Gerard's [1] observations of 50 cases, a constant occurrence. Obliteration after this time gradually progresses by means of proliferation of the endothelial cells and their subsequent invasion by fibrous tissue, the whole process terminating at about the end of the second year. Other data collected by the writer on the ductus arteriosus comprise the histologic structure and its anatomic position. In variance with the view of a loose connective-tissue adventitia, this coat was found markedly hypertrophied. The intima consisted of concentric layers of connective tissue and endothelial cells. In the oval or quadrangular space bounded by the bifurcation of the pulmonary artery and the concave border of the aortic arch a lymph-gland was often found. From the bifurcation of the aorta, the origin of the ductus arteriosus, which invariably arises from the left pulmonary artery, is distant from about 1 to 7 millimeters.

To the literature of **complete coarctation of the aorta,** of which 14 cases have been recorded, Dickinson and Fenton [2] contribute an additional case. The constriction which always occurs at or near the junction of the aorta and the ductus arteriosus was in this specimen double, the deeper constriction causing the complete obliteration. Marked cardiac hypertrophy and dilation, insufficiency of the aortic valve, which consisted of but two segments, anterior and posterior, both of which were thickened and very resistant to motion, also hypertrophy and dilation of the first portion of the aorta, constituted the most noteworthy pathologic alterations. The collateral circulation had been established through the internal mammary and upper four intercostal arteries, the former being markedly dilated, thickened, and tortuous. Clinically the patient bore the symptoms of marked cardiac enlargement and aortic insufficiency.

Temporal Artery.—The dissection of 200 temporal arteries leads Dall Acqua [3] to emphasize its true relationship to the superficial structures. It courses between the fascia temporalis and musc. auricularis superior and galea and cannot therefore be regarded as a subcutaneous artery, with the exception of its upper portion. Its normal branches are said to be the A. auricularis ant. inf. to the concha and external auditory meatus, also the A. auricularis ant. sup., which supplies the helix and the musc. auricularis ant. and sup. Among the variations noted were its termination in 9 cases in a single trunk, a constant occurrence in the carnivora, and the presence of three end branches in one case.

Bartels [4] describes an interesting **vascular curiosity** in a specimen of an **arterial loop** formed by the A. recurrens radialis surrounding

[1] Jour. de l'Anat., t. XXXVI, No. 1, p. 3.
[2] Lancet, Oct. 27, 1900.
[3] Monitore zoologico italiana, Anno IX, No. 10, p. 317.
[4] Anat. Hefte, Bd. XV, H. 1.

the N. radialis (musculospiral nerve). This anastomosis, which was situated in the lower portion of the arm, circumscribed a space about 1 centimeter in length. Of its two component limbs the radial was slightly the thicker. Other variations in this arm were the absence of the musc. palmaris longus, the A. recurrens ulnaris and collateralis ulnaris superior, also the presence of a supracondyloid process, posterior to which passed the NN. ulnaris and mediansus and A. collateralis ulnaris inferior.

Renal Vessels.—Brodel,[1] in a description of the intrinsic blood-vessels of the kidney, distinguishes among the various forms of pelves two main groups, viz.: (1) true pelves with major and minor calices, and (2) divided pelves where communication between all these calices within the kidney is excluded.. In both these forms a variable number of calices, usually eight, are arranged in a double row, which in a divided form is interrupted by a horizontal zone of cortical substance. The distribution of arterial branches within this viscus occurs in such a manner that three-fourths are anterior and but one-fourth posterior to the pelvis. The renal arteries divide at the hilum into four or five branches, each of which bifurcates into a large anterior and small posterior end artery. The anterior branch supplies not only the anterior pyramids, but also half of the posterior. At the uppermost and lowest calices an additional artery of variable origin is found, most commonly arising in conjunction with the anterior and posterior branch in the substance of the kidney, which constitutes the so-called median branch. In other instances this derivation may either be directly from the renal artery or from the aorta, in the latter case forming a supernumerary renal artery. The incision, with the view of exposing the pelvis in conformation with these findings, is next considered. In the normal organ a depression between the posterior flat and anterior convex surfaces indicates the lateral zone or zone of cortical substance interposed between the anterior and posterior row of calices. Along this depression the capsule frequently forms a whitish band, to which the perirenal fat seems to be more intimately adherent than elsewhere. Anterior to this depression is situated the line of division of the anterior and posterior rows of pyramids; posterior to it is that of the arterial system of the two halves. The incision in nephrotomy is to be made accordingly.

LYMPHATICS.

Lymphatics of the Mammary Gland.—Gelsner,[2] from a series of dissections of newborn infants, determines the lymph-radicles of the mammary glands, of the overlying skin and adipose tissue, and also those of its muscular bed. The view is expressed that lymphatic glands partially subserve the function of contractile organs which naturally aid in the circulation of the lymph. Their reniform shape, vas afferens emptying into the convexity, and vas efferens arising from the concavity,

[1] Johns Hopkins Hosp. Bull., 1901, No. 118, p. 10.
[2] Arch. f. klin. Chir., 1901, H. 1, S. 134.

would seemingly indicate that rhythmic contractions occur and conjointly open one channel while closing the other. Rhythmic contraction of the lymph-glands is assumed to be probable from the presence of a muscular sheath and the fact that the spleen and cysterna magna are now known to be possessed of the same function. The axillary glands are grouped into five series, which are, however, not distinguishable clinically: (1) Glandulæ lymphaticæ thoracales anteriores, along the anterior border of the pectoralis major; (2) glandulæ lymphaticæ thoracales inferiores, along the long thoracic artery from the fifth intercostal space upward; (3) glandulæ lymphaticæ thoracales posteriores, along the subscapular vessels; (4) glandulæ lymphaticæ thoracales superiores, s. brachiales, at the apex of the axilla and in relation to the axillary vessels; (5) glandulæ lymphaticæ thoracales intermedia, found at the upper axillary wall, which became directly continuous with the glandulæ lymphaticæ subpectorales, lying between the thorax and pectoralis minor muscle, and also with the glandulæ lymphaticæ subclaviculares, situated medial to the latter between the pectorales major and the thorax. The lymphatic vessels emptying into the anterior thoracic glands pass through the subpectoral glands, from which they either directly or by the intervention of the glandulæ intermedia issue as single or a double trunk, the truncus subclavius, and accompany the subclavian vein to the angulus venosus. In its course the truncus subclavius passes in some instances through a gland corresponding to the inferior cervical gland of some authors. The lymphatics of the mammary gland proper empty for the most part by two or three trunks into the anterior thoracic glands, from which they follow the route already described; a portion of them, however, perforate the pectoral muscle and empty into the mediastinal glands, with the exception of those in the sternal portion of the pectorales major, which empty into the subpectoral group of glands.

The relation of adipose to lymphatic tissue is dwelt upon by Betagh,[1] who found the former either surrounding the glands, notably at the hilum, or in isolated single or multiple masses within them. In the latter case the connection between the fatty tissue at the hilum and interior is usually quite distinct. From the scarcity of karyokinetic figures in the cells these findings are neither to be interpreted as a degeneration or lipomatosis of the gland, nor as indicating the derivation of lymphoid tissue from fat.

VISCERA.

Dentitio Tertia.—Antal[2] reports a case of dentitio tertia, but which, owing to the absence of an embryohistologic examination, he somewhat reluctantly terms hyperdentition. The supernumerary teeth in this case (a woman 26 years of age) consisted of one incisor posterior to the interval of the upper central incisors, and two pairs of lower premolars; the latter, two on each side, varied in position; on the right side they replaced the permanent molars which had been extracted about

[1] Il Policlinico, 1901, No. 4.

[2] Wien. med. Woch., No. 17, S. 810, 1901.

8 years previously. On the left they adjoined the normal bicuspids and lay internal to them. The cause for this bilateral variation is to be sought in the fact that while on the left side the molars had been removed, on the right the attempts had not been successful, the roots still being present. The root of the right posterior of these supernumerary premolars after removal was seen to have the same form and size as the root of a normal second premolar. In conclusion attention is called to the mammalian dentition of the eocene period, which includes that of the human ancestor ($I\ \frac{3}{3}\ c\ \frac{1}{1}\ prm\ \frac{4}{4}\ m\ \frac{3}{3} = 44$). As seen in this dental formula incisors and premolars were at that period numerically greater.

The existence of a mucous fold bridging the superior and inferior alveolabial sulci at the interval of the incisor and canine teeth, and which becomes more distinct by retraction of the lips, is made the subject of a more detailed investigation by Favaro Lombroso, Treves, and Olivetti.[1] This vestibular fold, first called attention to by Ehlers in 1881, occurs in a number of mammals at variable positions and is not dependent on the presence of incisor, canine, or premolar teeth. In animals having cheek pouches it forms the anterior wall of their buccal diverticulum. Of the two folds, the inferior is by far the more constant both in mammalia and in man. In the latter it is a distinct occurrence in 6%, and persists as a vestige in about 15%. Among 100 males and 122 females mentally afflicted it was found as a well-developed fold in 9%; in epileptics in 36% among men and in 25% among women. In criminals (130 examined) the vestibular fold was noted in 36%. Lombroso (with a seeming disregard for these figures) advances the presence of this fold as another trait characteristic of the congenital criminal.

Molar Glands.—Nicola and Ricca-Barberis[2] propose to limit the term Gl. molares to the mucous glands lying external to the buccinator muscle in contradistinction to the Gl. buccales which lie internal to it and opposite to the premolar teeth. Intermediate forms, however, occasionally occur in the substance of the muscle. The mucous character of all of these types is confirmed.

The existence of an **anastomosis of contiguous glandular tubules,** which have been variously demonstrated by Braus in Cowper's gland, Hansemann in the alveoli of the lung, and by Zimmerman in the fundus of the stomach, is again corroborated by the findings of the latter observer[3] in the serous glands of the human tongue. These anastomoses are stated to be especially distinct in the sulcus of the papillæ vallatæ, and different gradations of mere contact to complete continuity were observed. The anastomosis of the serous tubules in man is stated to be a common occurrence and is genetically explained by the contact of adjacent tubular cells sufficient in number to insure the formation of a lumen.

Sensibility of the Peritoneum.—From the field of clinical obser-

[1] Arch. di Psichiatria, XXII, 1901.
[2] Giornella della R. Academia di Medicina, Torina, vol. VI, t. 7, p. 20.
[3] Anat. Anz., Bd. XVIII, 15, 16, S. 373.

vation, Lennander [1] derives the deduction that the visceral peritoneum is devoid of all sensations, such as touch, pain, and that of temperature, while in the parietal peritoneum the opposite is the case. Observations and experimentation during operations upon the stomach and intestines, gall-bladder, kidneys, etc., conducted with infiltration-anesthesia are stated to have shown the fact that manipulation and other irritation remain unperceived by the patient. Not till the stretching of these viscera, thereby making tense the parietal peritoneum, were these procedures noticed subjectively. The parietal peritoneum derives its pain-conducting nerves from the intercostal, lumbar, and sacral trunks. Posteriorly,—that is, prevertebral,—in the absence of nerve relations, a similar normal anesthesia as in the visceral serosa can be said to have been ascertained. In regard to intraabdominal pain, colics of various sorts, inflammations, etc., the theory is advanced that these are produced by tension on the parietal peritoneum. In the absence of such tension or inflammation, pathologic processes pursue a painless course.

Appendix Vermiformis.—Sudculki's [2] observations upon a series of 500 appendices embody the following deductions: Gerlach's valve is absent or nonexistent in two-thirds of all cases. When present, it cannot be regarded as forming an actual barrier to either the ingress or egress of fecal matter. In more than one-half of the appendices examined was fecal matter found within this process, though fecal concretions are said to be rare. While the former cannot be regarded as pathologic, concretions are attended with danger, being the causative factor of perforation, if not of all inflammatory processes. The obliteration of the appendix is in direct ratio to advancing age, but in an inverse ratio to its length. Obliteration is to be regarded rather as an act of involution than a product of inflammation. Adhesions around obliterating appendices were found to be quite common.

Development of Duodenum.—In the studies of Tandler [3] in a dozen human embryos 7 to 12 millimeters in length, the development of the duodenum during this period (30 to 60 days) was made the object of special research. In the youngest of these embryos the duodenum was found to be wide and patulous; in the older ones progressive proliferation of epithelial cells produced an entire occlusion at about the middle of the above period. Subsequently this occlusion gradually disappeared. The cause of this peculiar process is to be sought for in a disproportionate increase of the entodermic elements, the persistence of which up to birth may well account for the occasional occurrence.

Pancreas.—Glinski,[4] in a résumé of 14 cases of accessory pancreases, including a report of his own case, concludes that the "Anlage" of the pancreas is multiple and not single. From the various positions of this structure in the cases so far reported, one by "Hauptanlagen" and three "Nebenanlagen," viz., two in the intestinal and one in gastric or duodenal walls, are described. In his own case the pancreas, which

[1] Centralbl. f. Chir., No. 8, 1901, S. 202.
[2] Mitth. a. d. Grenzgeb. d. Med. u. Chir., Bd. VII, H. 4 u. 5.
[3] Morpholog. Jahrb., XXIX, 2, S. 187. [4] Virchow's Arch., CLXIV, S. 132, 1901.

was accidentally discovered during a necropsy, was situated in the muscularis of the posterior gastric wall. An excretory duct, although specially sought for, was not found, but nevertheless thought to have been present. Accessory pancreases, according to their derivation, are divided into three groups: (1) Pancreas minus, an accessory lobe of the pancreatic head; (2) pancreas accessorium, consisting of pancreatic tissue and distinct from the main organ; (3) pancreas divisum, due to the segmentation of this organ by mechanical means, such as supernumerary arteries.

Schultze,[1] with the view of determining the **relationship between the pancreatic parenchyma and the islands of Langerhans,** experimentally isolated portions of this viscus in guinea-pigs by means of silk ligatures. The ensuing degeneration of the parenchyma, in connection with the fact that Langerhans' islands remained intact and bore no evidence of pathologic changes, elicits the conclusion that they are to be regarded as distinct organs with a definite function, that of influencing the sugar-converting substances of the body. As clinical proofs of such function are cited the absence of diabetes after both partial pancreatotomy and ligation of Wirsung's duct. In total extirpation of the pancreas, diabetes, as is known, rapidly follows.

Spleen.—The notches and fissures of the spleen, Parsons,[2] upon an examination of 113 spleens, ascribes to causes other than atavism—viz., to the effect of pressure and traction. In a tabulated report of his findings relative to the indentations of this organ along its borders and on its surfaces, notches and fissures are seemingly not so well marked in the young spleen—that is, below 2 years—as in the older types. The inconstant presence of these notches in the descending scale of the animal kingdom and their tendency to be less frequent in the human embryo spleen also seem to point to a postnatal acquirement. Pressure such as may be caused by surrounding viscera, its own growth, and by its arteries, also traction as exerted in man by the gastrosplenic omentum, are supposedly the factors producing crumpling of the spleen, with its resulting notches and fissures.

Urethral Diverticulums.—Thomson,[3] with the assumption of its being a vestige of the ducts of Müller, describes a case in which two structures were found in relation to the base of the bladder; both of these were placed in the median line and lined by mucosa directly continuous with that of the urethra. The uppermost and longer of these diverticulums, 15 millimeters in length, lay in the external trigone between the bladder and rectum, its blind end midway between the vesical ends of the ureters and the opening near the apex of the internal trigone. The other diverticulum, which consisted of a sac 17 millimeters in length, occupied the position of the sinus pocularis and ended blindly between the two lateral lobes of the prostate. Near its termination a slight elevation corresponding to the colliculus seminalis

[1] Arch. f. mikrosk. Anat. u. Entwickelungsgeschichte, Bd. LIV, H. 3.
[2] Jour. Anat. and Phys., vol. XXXV, part III, p. 416, Apr., 1901.
[3] Jour. Anat. and Phys., July, 1901, vol. XXXV, part IV, p. 492.

was found, on each side of which were the openings of the common ejaculatory ducts. This diverticulum opened into the prostatic urethra below the orifice of the upper one.

Anomaly of Uterus.—Siebourg [1] reports a case of uterus bicollis subseptus unicorporeus, found in a patient treated for abortion. Of the two necks of the uterus, the posterior had the broader and more reddened orifice, an evidence of the seat of abortion. The septum between the two cervical canals lay in a transverse direction and extended for about two-thirds of their length. At their upper end both canals continued into a common uterine cavity. From a developmental standpoint this anomaly is accounted for by misplacement of a portion of the Müllerian duct, angulation, separation, and subsequent growth of the same.

Thymus Gland.—Harmann [2] describes two variations of the thymus gland of full-timed fetuses, in which two cervical, asymmetric prolongations extended in an upward direction, the left of which reached to the angle of the mandible. At the level of the isthmus thyroideæ this left process enlarged into a fleshy mass, irregular in shape and of thymic glandular appearance. This enlargement, termed socia thymi cervicales, was connected with the main portion of the gland by a narrow flexuous cord and superiorly to an additional lobule by a short narrow isthmus of glandular tissue. Owing to the tortuosity of this process the relations to the vessels and vagus nerve were altered in various parts of its course, being at different parts internal, external, and superficial to it. The vagus nerve encircled the isthmus connecting the socia with the superior lobule, and the N. descendens cervicis arose from the anterior division of this annulus. As to the significance of this anomaly, the presence of cervical prolongations of the thymus gland is remarked upon as being the normal occurrence in birds and certain of the mammalia. Embryologically it represents a retention of the lateral outgrowth of the third gill pouch.

Persistence of the thymus tissue, which has been shown to be a constant occurrence in a diffuse form throughout portions of the retrosternal tissues, in a case of Fisher [3] retained its infantile shape as a so-called gland. This rare anomaly, occurring in a man 30 years of age, consisted of two lobes placed between the sternum and pericardium and lay superficial to the great vessels of their respective sides, carotid and subclavian arteries and innominate veins. Of the two lobes, the left was the larger and of a more irregular outline. Microscopic section verified the thymic character of its tissue.

The function of the thymus gland, a question which among physiologists has given rise to many problematic theories, is explained by Beard,[4] along embryologic studies, to be that of a leukocyte-forming organ. According to his theory this gland embodies not only the parent

[1] Centralbl. f. Gynäk., No. 23, 1901, S. 639.
[2] Jour. Anat. and Phys., vol. XXXVI, part I, p. 47, 1901.
[3] Anat. Anz., Bd. XIX. No. 5 u. 6, S. 113.
[4] Anat. Anz., Bd. XVIII, No. 22, 23, u. 24.

source of all leukocytes, but is also the derivative of all lymphoid structures, lymph-glands, tonsils, etc. The leukocytes are stated to be the direct descendants of epithelial cells of the thymus gland, and are therefore of hypoblastic origin. Not appearing before the development of this gland, they invade the mesoblastic tissues, and with advancing growth of the embryo increase in number. Their emigration is unimpeded by any barrier, such as a capsule. The observations from which this deduction is derived comprised an extensive series of various sizes of the embryos of the skate (Raja batis). The statement that the appearance of leukocytes in the tissue is almost concomitant with the first traces of the thymus gland seems to the author conclusive proof of the true function of this gland.

Thyroid Gland.—Odenfeld and Steinhaus,[1] subsequent to the removal of a left frontal tumor diagnosed as osteosarcoma, found the same, as verified by microscopic section, to consist of normal thyroid tissue. As the woman, 58 years of age, bore no symptoms indicating a pathologic condition of this gland, the theory of metastases of the thyroid gland is advanced.

Anomaly of Lung.—Wechselheig [2] records a peculiar condition of a pneumonic tumor of the left lung of a newborn infant. The pedicled tumor occupied a portion of the left pleural cavity and had its origin in close approximation to both esophagus and diaphragm. Of a light grayish-red color, soft consistence, and with a smooth surface, microscopic examination disclosed the presence of numerous cavernous spaces divided by septums of yellow elastic tissue, rich in cells. According to the character of one layered mucosa, these caverna could be divided into two groups, viz., those with cubic and cylindric epithelium, the latter frequently ciliated. This division, however, had but an ordinary significance, as instances of intermingling of both types were frequent. As a whole, the tissues forming this tissue consisted of typical lung tissue, with embryonic alveoli and dilated bronchi. Its occurrence is explained by a developmental aberration, such as an outgrowth from the diverticulum of the foregut, which subsequently gives rise to the lung.

NERVOUS SYSTEM.

Neuroglia.—From an observation on a woman 61 years old, Aguerre [3] describes the variable forms of the neuroglia cells and their nuclei. The multiform nuclei of these cells can be divided into the following groups: (1) Small, dark nuclei, 3 to 4 millimeters; (2) medium-sized and sausage-shaped nuclei, 6 to 8 millimeters; and (3) large nuclei of a flask-shaped appearance and up to 14 millimeters in size. The number of nuclei in the different segments of the cord were found to be in an inverse proportion to the neuroglia fibers. At the junction of the posterior roots with the cord, in the septum inter-

[1] Centralbl. f. allg. Path. u. path. Anat., 1901, No. 5.
[2] Centralbl. f. allg. Path. u. path. Anat., Bd. XI, No. 16 u. 17.
[3] Arch. f. mikrosk. Anat. u. Entwickelungsgeschichte, Bd. LVI, S. 509.

medium posterior and around the central canal, but few of these cells were found. In the horn of the gray matter large numbers occurred. Fragmentation or indirect amitotic division was also noted. Aguerre looks upon neuroglia cells not only as a form of nervous connective tissue, but also regards them as an essential factor in the lymphatic circulation of the spinal cord.

Sympathetic Nerves.—Barbieri [1] ascribes to the sympathetic nerves a spinal and cerebral origin. In his researches on mammalian spinal ganglia in rabbits, guinea-pigs, cats, and dogs, the ganglia contained from 200 to 500 ganglion cells, the identical number found in the rami communicantes. From the posterior root 1000 to 3000 fibers pass through the ganglia, while the anterior root contained from 500 to 1500 fibers.

Dercum and Spiller,[2] in a specimen of a spinal cord, were able to observe **medullated nerve-fibers in the pia of the sacral, lumbar, and dorsal regions.** These fibers were found to be most numerous around the posterior columns of the cord and could in several instances be traced into these columns. As in this case replacement of fibers which had undergone previous destruction can be excluded, the hypothesis is advanced that while normally medullated fibers pass from the cord into the pia, exceptionally a variation of white fibers may occur. [Similar instances have been reported as having occurred in the retina.]

That vascular and perivascular **Vater-Pacinian bodies** are of constant occurrence in and around the aorta of man and other animals, rabbits, dogs, cats, guinea-pigs, is the conclusion of Rachmanow,[3] derived from a somewhat detailed investigation on the subject. The greatest number of these bodies were found in the perivascular connective tissue of the beginning of the abdominal aorta. With the downward course of this vessel the number increases, while in and around the thoracic aorta they were totally absent. In the guinea-pig these bodies also surrounded the inferior vena cava. Rachmanow concludes with the supposition that Vater-Pacinian bodies are probably present in and around all the larger vessels.

Nerves of the Lymphatics.—The suppositions and views heretofore advanced concerning the existence of the nervous mechanism for the lymphatic vessels similar or identical to the vasomotor system in blood-vessels are substantiated by the investigation of Kytmanof [4] on the thoracic duct and vas deferens of certain of the mammalia—dog, calf, etc. Around the arterioles and the vasa sanguinea vasorum lymphaticorum small nerves occur, which anastomose with each other and form in the adventitia of the thoracic duct and lymphatics of the vas deferens an adventitial or ground network. From this network fibers pass inward and form other plexuses, such as the supramuscular, in reality the innermost portion of the adventitial network, the intramuscular and subendothelial plexuses. All of these consist for the

[1] Compt. rend. de Paris, t. CXXX, No. 15, p. 1039.
[2] Proc. of Path. Soc. of Phila., May, 1901.
[3] Anat. Anz., Bd. XIX, No. 21, S. 555. [4] Anat. Anz., Bd. XIX, No. 15, S. 369.

most part of nonmedullated fibers and contain both sensory and motor nerves. Many of the nerve-endings in the media are similar to Ranvier's "taches motrices." In the intima and adventitia these endings are variable, both simple or compound terminals being found. In the intima many of the nerves of the subendothelial plexus are of a varicose type. The similarity of structure between these plexuses and those in the vasomotor system seems to presuppose a corresponding similarity in function in both lymphatic and vascular system.

SPECIAL ORGANS.

Merlin [1] describes a case of the rare affection of **congenital bilateral lacrimal fistula** in the left eye of a male patient. A round opening 2 millimeters in diameter was seen in the saccus lachrymalis near the opening in the lacrimal duct. The adjacent integument was soft, thin, of rosy color, and contained no cicatricial tissue. Permanganate solution dropped into the eye was found to appear almost immediately in the nose, and the smoke of a cigarette issued from this opening during a forced expiration. On the right eye a capillary fistula was noted both above and below the caruncula lachrymalis. The lacrimal canals were patulous and the puncta lachrymalis very plain. Epiphora was not complained of in either eye.

Fein substantiates his observations on cadavers relative to the **shape of the glottis** and position of the vocal cords, by control experiments on animals. Shortly after death the vocal cords are in the median line or approximate to it. With the advent of rigor mortis the width of the rima glottidis is increased in proportion to the degree of the same. Subsequently their position may be stated to be intermediate to the two foregoing. In children stillborn, and which had not respired, the glottis was found closed, while in those in which artificial respiration had been practised, the triangular open glottis prevailed. The limited number of observations on the shape of the glottis in stillborn infants forbids that a definite conclusion be deduced; that is, as to whether or not a closed rima glottidis indicates the failure of the respiratory act.

A case of **abnormal lacrimal opening** connected with the left gland and situated about 3 centimeters external to the eye is reported by Bamberger.[2] Drops of tears appeared at this opening at periods of 10 minutes and constantly rolled down the cheek. The possibility of its being of a salivary nature is discountenanced by the fact that the methods employed to stimulate salivary secretion failed in their purpose to alter the rate of flow from this anomalous orifice.

Double Inferior Turbinal.—Sturman [3] notes, in a woman afflicted with nasal disease, a peculiar condition of a bilateral double inferior turbinated bone. Complete division by sulcus, which, as is known, occasionally occurs on the convexity of this bone, and the presence of

[1] Wien. med. Woch., No. 15, 1901, S. 722.
[2] Deut. Arch. f. klin. Med., Bd. LXIX, H. 5 u. 6.
[3] Berlin. klin. Woch., 1901, No. 28, S. 744.

which is due to inhibited development ("Hemmungsbildung"), is given as a factor from which such an anomaly may arise.

Anomaly of Ear.—In an infant whose right external ear was congenitally malformed, Haug,[1] from a dissection of the internal and middle ear, determined a series of further aberrant conditions. The external auditory canal was markedly constricted and the tympanic membrane and cavity were found to be only partially developed. The Eustachian tube was represented by a column of solid bone, the musc. stapedius was absent, and the N. facialis diminished in diameter. The auditory ossicles also were of an abnormal development, the malleus being inserted into the tympanic membrane and to the formless incus, while the stapes had no connection with this bone, but was firmly ankylosed to the fenestra ovalis.

MISCELLANEOUS.

In a report of 5 cases of **sacral tumors** Luiser[2] mentions one in which the thyroid embryonic cord, nerve-cells, and stomach could be well distinguished. Renal and lung tissue, esophagus, and trachea were also thought to have been present.

Marwedel[3] describes a case of **persistent blastopore** which occurred in a newborn child. The opening lay in the interval between the coccyx and sacrum and continued as a cylindric sac, 6 centimeters long, through the dura to near the intestines. From the relations described the identity of the mesenteric canal and blastopore seems assured. It acquires interest from the fact that this canal may exist up to birth, thereby confirming the commonly accepted theory of sacrococcygeal tumor.

A case unique in the annals of developmental aberration—a **fetal inclusion of the gut-tract in the ascending mesocolon**—is reported by Ahrens.[4] In a girl of 18, operated for a right renal tumor, a cyst in the ascending mesocolon, containing about 4 liters of sanguineous fluid, was exposed and extirpated. In gross appearance it resembled a dilated stomach, with an appendix 26 centimeters long. The sac presented constrictions analogous to the cardiac and pyloric ends of this organ, and also had a median enfolding as in the hourglass-shaped type. On microscopic section the different coats—fibrous, muscular, submucous, and mucous—could be distinguished. The mucous lining of this tumor was interrupted, consisting of islands of epithelium, between which a smooth fibrous surface intervened, so that it was structurally of a multiple character—buccal, esophageal, intestinal, tracheal, bronchial, and gastric mucosa; that is, epithelia, such as squamous, ciliated, etc., peculiar to these tracts were all represented, even villi and gastric glands being found. The conclusion is drawn that a fetal inclusion of the gut-tract (with the yet undifferentiated respiratory tract) could possibly account for the formation of such a tumor.

[1] Monatssch. f. Ohrenh., 1901, No. 3. [2] Beitr. z. klin. Chir., Bd. XXIX, H. 2.
[3] Beitr. z. klin. Chir., Bd. XXIX, H. 2.
[4] Arch. f. klin. Chir., Bd. XLVI, H. 4, S. 26.

A singular monstrosity occurring in a twin pregnancy—an **amorphous acardiac monster** in which the spinal column and ribs were represented and the head and limbs partially absent—is described by Charlton,[1] consisting of a mass oval in outline ($7\frac{1}{2}$ inches long, $5\frac{1}{4}$ inches wide, and $2\frac{1}{2}$ inches thick), its cephalic pole covered by a tuft of hair, and its spinal column marked externally by a groove. The skiagraph revealed the presence of a fairly complete axial skeleton and rudimentary scapulas. Four depressions were found in the cephalic pole, and further depressions indicated the regions of anus and arms, while two small buds formed the only representatives of the lower extremities. Heart and all viscera, with the exception of a pear-shaped body continuous with the urachus and filled with a jelly-like substance (bladder), were absent. The rudimentary aorta terminated at about the position of the normal arch, where it gave origin to several branches, the lateral taking the course of the subclavian and the central proceeding toward the cephalic pole. Three vessels converged toward the umbilicus, —the urachus and two hypogastric arteries,—the latter uniting presently, then continued as a single trunk through the abdominal cavity into the thorax, several lateral branches arising from it along its course. Thorax and abdominal cavity, the latter lined with peritoneum, were continuous. The first-born fetus of this twin pregnancy was a full-time, well-developed female, and had a separate sac, although its placenta was adherent to that of the monster, thereby forming a figure 8.

[1] Jour. Anat. and Phys., 1901, vol. XXXVI, part I.

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